

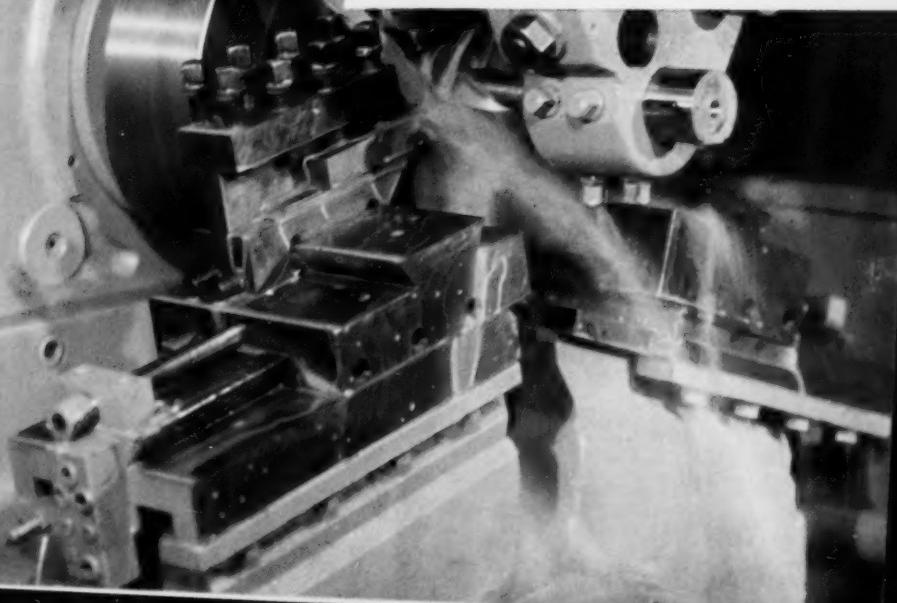
modern machine shop

**Put your plant in the pink
Switch to CIMCOOL
CUTTING FLUIDS**

CIMCOOL® Cutting Fluids lower costs . . . cover 100%
of all metal cutting operations . . . and do a better job.

®Trade Mark Reg. U. S. Pat. Off.

**CINCINNATI MILLING PRODUCTS DIVISION
THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO**



Decision at SPS

STANDARD PRESSED STEEL CO.
JENKINTOWN, PENNA.



A moment of decision . . . after months of trial, weeks of conference . . .

It's ADAMAS . . . again . . . and it's no surprise that Adamas tungsten carbide is specified at SPS . . . for Adamas tungsten carbide products are subject to the world's most rigid set of quality control procedures.

Careful selection of materials lies at the heart of quality control at SPS. And, at SPS, where carbide is called upon for use in a great variety of applications, Adamas tungsten carbide is a logical choice . . . for there's an Adamas carbide grade for every job.

Standard Pressed Steel Company of Jenkintown, Pennsylvania is the world's largest manufacturer of Socket Screw Products, Cap Screws, Set Screws and a variety of other threaded fasteners. These SPS products are used on aircraft, home appliances, business machines, in fact, wherever products or components must be held together.

A continuing program of research and development at SPS assures a lasting place for the Company in America's future.

**ADAMAS CARBIDE CORPORATION
KENILWORTH, NEW JERSEY**

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modern machine shop

MARCH
1956
Vol. 28
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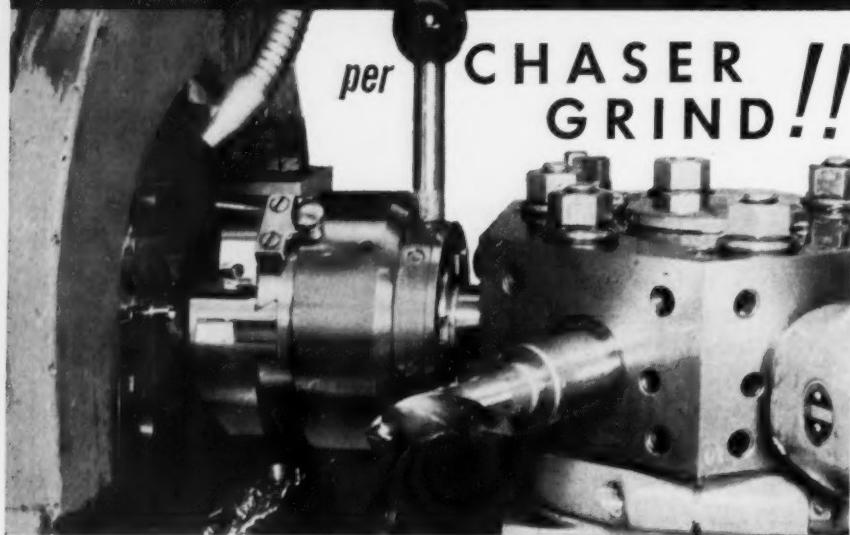
Member



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(For more information on cover advertisements, use Reader Service Cards)

1800 Stainless Steel Threads



LANDMATIC HEADS are every day saving production dollars for the Crawford Fitting Company of Cleveland by low tool cost and minimum machine downtime.

This company manufactures Swagelok Tube Fittings ranging from $\frac{1}{8}$ " to 1" in diameter. These fittings are produced from stainless steel tees of austenitic type 316 cold-worked to a Brinell hardness of 250. In producing the $\frac{7}{16}$ " fitting, for example, (as illustrated) 20-pitch straight UN threads are cut close to the shoulder $\frac{5}{16}$ " long to Class 3 fit.

LANDMATIC Hardened and Ground Heads, such as used by Crawford, are designed to produce threads to Class 3 or 4 fit in all types of tough materials. Unusually heavy construction and sound funda-

mental die head design assure the rigidity necessary for accurate threads. The inherent features of the design of the Landis Tangential Chasers and their proper manufacture and hardening, developed during 50 years of threading experience, ensure long chaser life and low threading cost.

If you require threads on stainless steel or other tough material, LANDMATIC Hardened and Ground Heads offer you these same cost-saving features. Please send specifications and write for Bulletin F-80 for additional information.

LANDIS
Machine
COMPANY

WAYNESBORO PENNSYLVANIA, U. S. A.

THREADING MACHINERY—THREAD CUTTING DIE HEADS—COLLAPSIBLE TAPS

367

These THREADING TOOLS displayed at Booth 578 -- ASTE Show

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DUST



COLLECT IT
WITH
Hammond
DUSKOLECTORS

CYCLONE



FILTER

Your plant produces dust in a surprising number of locations. By collecting it at the source you:

- Provide healthier working conditions
- Protect costly machines
- Reduce cleaning and painting costs

Hammond Duskolectors don't cost—they pay!

Clip this page to your letterhead. Duskolector catalog with helpful engineering information and interesting installation views will be sent at once.

Hammond Machinery Builders
INC.

1615 DOUGLAS AVENUE

•

KALAMAZOO, MICHIGAN

See us at Booth 675, ASTE Show, March 19-23, Chicago

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SPECIAL INTRODUCTORY UNIT

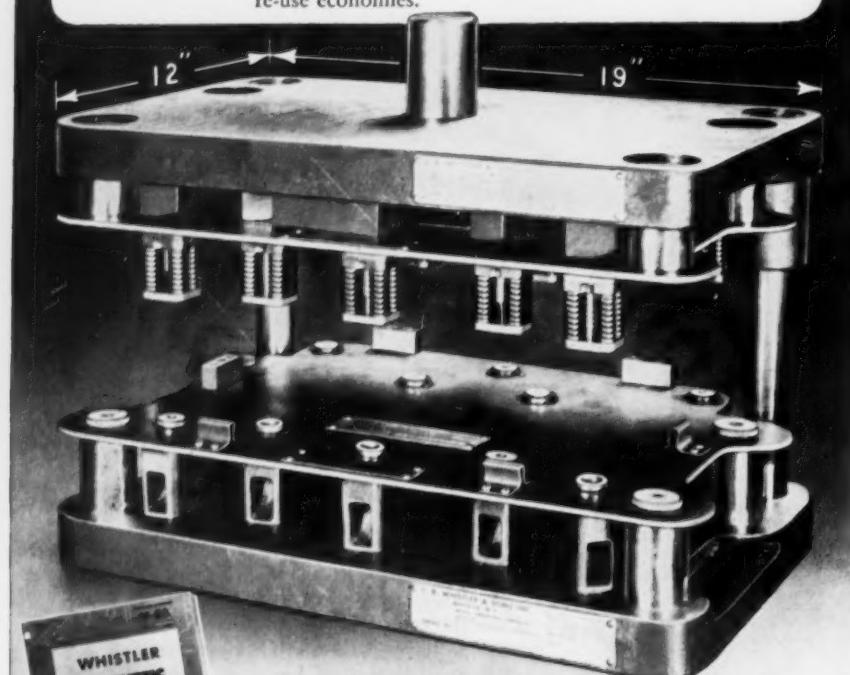
WHISTLER 10 HOLE MAGNETIC PERFORATING DIE

Cut die costs
drastically,
start
production
quicker

This M-12-14 Complete Introductory Unit includes a set of blank templates, ten punches, dies, strippers and punch and die retainers complete to make up a 10 hole precision perforating die. Any diameters from $\frac{1}{8}$ " to $\frac{1}{2}$ " to your selection. Catalog illustrates additional re-use economies.

\$675

NET F.O.B. OUR
PLANT



SEND FOR CATALOG Illustration shows how quick and simple it is to set up a Whistler Magnetic Perforating Die ready for production. Larger standard units can be added to suit your requirements.

S. B. WHISTLER & SONS, INC.

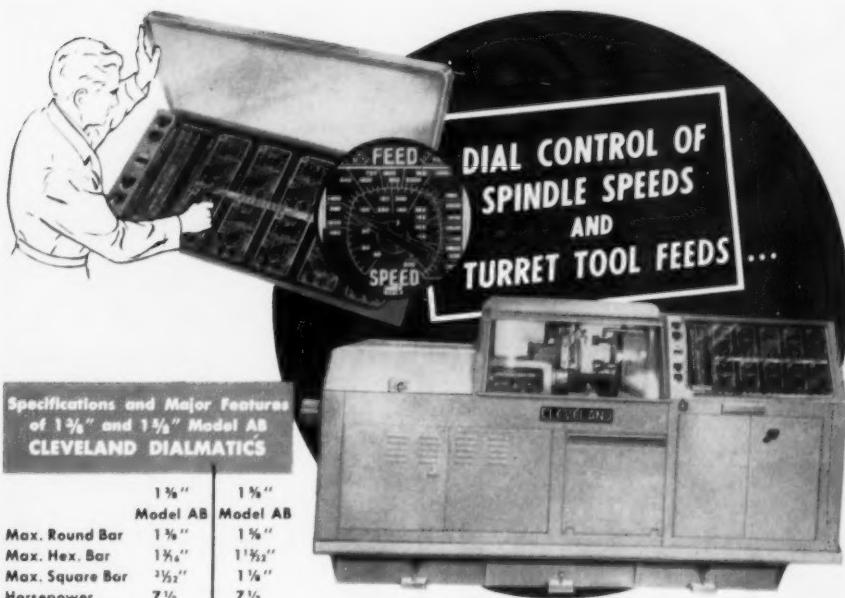
Manufacturers of Adjustable, Magnetic and Custom
Built Dies for All Industry

WHISTLER DIES ARE
CUTTING COSTS FROM
COAST TO COAST

740 Military Road

For more data circle 303 on Reader Service Card

Buffalo 23, New York



**Specifications and Major Features
of 1 $\frac{1}{8}$ " and 1 $\frac{5}{8}$ " Model AB
CLEVELAND DIALMATICS**

| | 1 $\frac{1}{8}$ " Model AB | 1 $\frac{5}{8}$ " Model AB |
|--------------------|-------------------------------|-------------------------------|
| Max. Round Bar | 1 $\frac{1}{8}$ " | 1 $\frac{1}{8}$ " |
| Max. Hex. Bar | 1 $\frac{1}{4}$ " | 1 $\frac{1}{2}$ " |
| Max. Square Bar | 2 $\frac{1}{2}$ " | 1 $\frac{1}{8}$ " |
| Horsepower | 7 $\frac{1}{2}$ | 7 $\frac{1}{2}$ |
| Idle Motion Time | 6.3 secs. | 6.3 secs. |
| Stock Feed Stroke | 9" | 9" |
| Turning Length | 4 $\frac{1}{2}$ " | 4 $\frac{1}{2}$ " |
| Dia. Tool Circle | 9" | 9" |
| No. Turret Holes | 5 | 5 |
| Cross Slide Travel | 4" | 4" |
| Cross Slide | | |
| Tooling Width | 6 $\frac{1}{8}$ " | 6 $\frac{1}{8}$ " |

Infinitely variable spindle speeds.
Spindle speed range—40 to 3200 R.P.M.
Cleveland exclusive quick change collet.
Quick change feedshell pads which require no screws.
Variable tool feeds through electric feed drive.
High speed Geneva turret index.
Flame hardened double cross slides.
Quick hand crank stock feed adjustment.
Universal camming and easily adjustable cam drums.

Write for new
1 $\frac{1}{8}$ " and 1 $\frac{5}{8}$ "
Model AB Bulletin

**gives you maximum productivity
with new 1 $\frac{1}{8}$ " and 1 $\frac{5}{8}$ " Model AB**

CLEVELAND DIALMATICS

Cleveland brings to metalworking another major advancement in single spindle bar automatic machine design! Now, by making *dial settings* on the control panel, you preselect the *exact* forward and reverse tool feed—and the *exact* forward and reverse spindle speed—for each of five working turret tools. Each tool is completely and individually controlled throughout the cycle... *tuned* for maximum cutting efficiency! There are *no change gears*. Spindle speeds are electronically controlled and infinitely variable between 40 and 3200 r.p.m. You can preselect and set 10 different spindle speeds for each machine cycle. Spindle speed changes and reversals are entirely automatic and are made through electric clutches, which make the number of changes or reversals per minute practically unlimited.

A few of many modern features of these new Clevelands are listed at left. It will pay you to get full information. Get in touch with a Cleveland sales engineer. He'll give you the full story on the many economies these new Clevelands can bring to your plant.

**4940 Beech Street
Cincinnati 12, Ohio**

SALES OFFICES: CHICAGO
CLEVELAND • DETROIT
HARTFORD • S. ORANGE

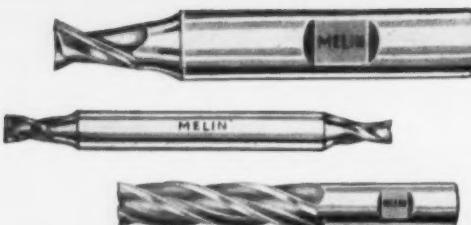
THE CLEVELAND AUTOMATIC MACHINE COMPANY

Manufacturers of a Complete Line of Single Spindle Automatic Screw Machines and High Pressure Hydraulic Die Casting Machines

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MELIN END MILLS



Representatives in principal cities.



**MELIN TOOL
COMPANY, INC.**

3373 West 140th Street
Cleveland 11, Ohio



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There is a difference
in end mills . . .
MELIN end mills!
Proof of this
is evident in the
continued increase
in **MELIN** popularity.
The growth in
MELIN tool acceptance
was by no means an
accident.

. . . The secret
is in **CONSISTENT
QUALITY**. This
standard of Quality
assures you better
performance . . .
longer lasting
performance . . .
CONTINUOUSLY . . .
from one shipment to
another.
Next time you order
end mills . . .
specify the finest . . .
specify **MELIN**.

MANUFACTURED IN
TWO, THREE AND FOUR
FLUTE TYPES.

V-R

TANTUNG CAST ALLOY cuts twice as fast as High Speed Steel



Facts About TANTUNG, V-R's Exclusive Cast Alloy:

TANTUNG CONTAINS CARBIDES—of tungsten, tantalum and columbium. This combination gives it superior toughness and lower friction coefficient than ordinary cast alloys.

TANTUNG IS STRONGER — transverse rupture strength double of most cast alloys.

TANTUNG IS EASY TO GRIND — aluminum oxide wheels used for hardened steel are suitable.

Visit V-R in Booth 1137
ASTE Tool Show
Chicago, March 19-23

V-R and TANTUNG are registered trademarks of Vascoloy-Ramet Corporation.

High Red-Hardness Plus Low Friction

As a rule, when using TANTUNG cast alloy cutting tools, start your machines at about twice the speed used with high speed steel. TANTUNG bridges the gap between the maximum speeds possible with high speed steel and the minimum speeds practical with cemented carbides. Its general cutting range lies between 80 and 180 surface feet per minute.

EXAMPLE: Recessing high alloy steel ring gear forging on semi-automatic.

| | H.S.S. | TANTUNG |
|-----------------------|-----------|------------|
| Speed: | 94 R.P.M. | 165 R.P.M. |
| Feed: | .004" | .008" |
| Depth of cut: | .125" | .125" |
| Pieces per grind: | 35 | 70 |
| Av. pieces per shift: | 38 | 100 |

... more than $2\frac{1}{2}$ times
production increase!

GET ALL THE FACTS in this
24-page free catalog. Send for yours today.



Manufacturers of cemented carbides and TANTUNG cast alloys

Vascoloy-Ramet Corporation

860 Market Street • Waukegan, Ill.

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**Improve Your Precision
Toolroom Grinding with**

NEW



**CINCINNATI FILMATIC
12" x 36"
UNIVERSAL GRINDER**

Other sizes: 14" and 18" swing. Between-center lengths: 36", 48", 72"



FILMATIC grinding wheel spindle bearings . . . never wear out; never require adjustment



Internal grinding head . . . always in place and ready for the job; dozens of quills, spindles and collets to choose from



Cross feed unit . . . completely new; two-speed; pickfeed all the way to final size

Cincinnati Filmatic Universal Grinding Machines

It's difficult to improve upon top performance, but it can be done. In toolroom grinding, for example, the new CINCINNATI FILMATIC Universal Grinders offer three-way improvement:

1 Improved accuracy. A new cross feed unit assures closer accuracy than ever before on your precision toolroom work; automatic pickfeed to a positive stop; .000050" minimum increment of adjustment.

2 Improved convenience of operation. Table and cross feed handwheels are raised to a more comfortable height; handwheels are larger; new headstock speed selector is easier to operate; push

buttons are relocated for easier accessibility.

3 Improved versatility. Hinged internal grinding head, a Cincinnati original, has been retained and improved upon with lifetime lubrication and a wider selection of quills, spindles and collets; pick-feed at either end or both ends of table cycle; power rapid positioning (extra) for wheelhead.

Additional reasons why CINCINNATI FILMATIC Universal Grinders are your best buy will be found in catalog No. G-663. Write for a copy.

**CINCINNATI GRINDERS INCORPORATED
CINCINNATI 9, OHIO**



Power rapid positioning . . . eliminates tiresome hand cranking from one diameter to another



CINCINNATI

CENTERTYPE GRINDING MACHINES • CENTERLESS
GRINDING MACHINES • CENTERLESS LAPING
MACHINES • MICRO-CENTRIC GRINDING MACHINES

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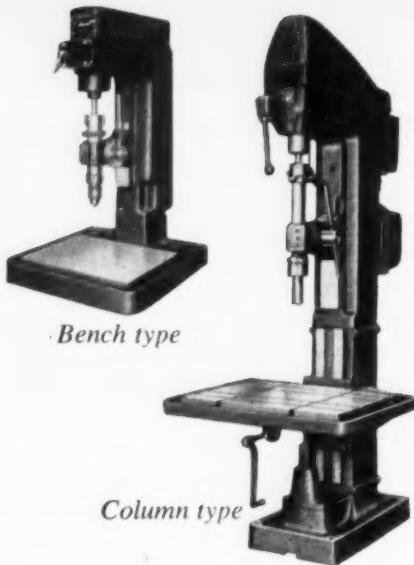
March, 1956

modern machine shop 9

► The many features of our standard drilling and tapping machines can be combined in more than 100,000 different ways—and one of those combinations exactly meets your requirements.

Capacities in cast iron from very small numbered drills to 2"; No. 32 Jacobs chuck to No. 4 Morse taper.

Six or 8 speeds up to 12,000 rpm; 4 feeds.



Bench type

Column type

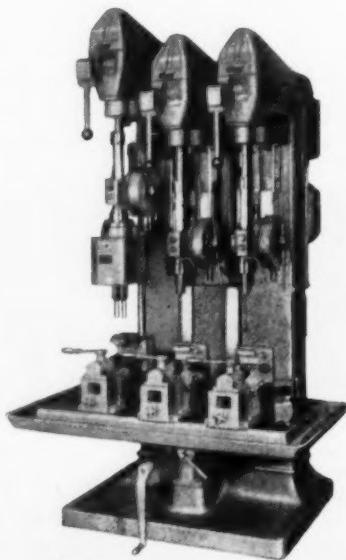
Avey has the right one

Column or bench type, with wide range of swing, 1 to 8 spindles.

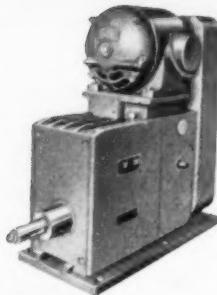
All of our standard drilling and tapping machines include such bonus features as micrometer stop collar, telescoping spindle guard, dynamically-balanced rotating parts, rack-and-pinion-operated motor plate, and our rugged, involute spindle construction.

Tool and die shops like the versatility, accuracy, and speed of our Tool Room machines. They're available with No. 2, 3, or 4 Morse taper. You select the table you need: large (34" x 25"), round (18" diameter), or compound (25" x 12").

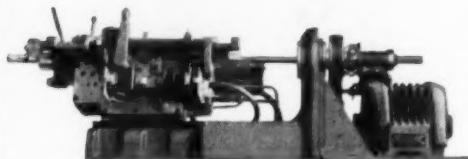
Ask for our literature; or, better yet, ask our representative to help you select the pay-off combination.



Multi-spindle



Cam feed unit



Avey-draulic

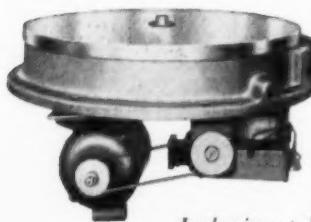


drilling,tapping,production machines

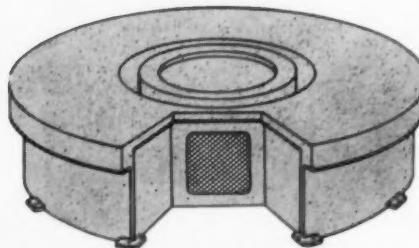
Sharp reductions in unit costs, floor space, machine-handling time, and operating time often make our high-production machines smart investments with fast pay-off periods. They have repeatedly proved this in some of the finest automatic lines in the country.

Our standard units can be combined for either rotary or linear operations. They can be economically re-engi-

for Avey makes them all



Indexing table



Standard base

neered for successive jobs.

Automatic cam feed units, for drilling, tapping, reaming, hollow milling. Vee belt or gear drive. No. 1, 2, or 3 Morse taper. Mount at any angle. Fully or semi-automatic. Tamper-proof.

Avey-draulic feed unit. Automatic withdrawal for chip removal only when necessary during deep hole drilling. Rapid advance, feed, and rapid return. Standard strokes 12" up to 30."

Automatic index tables. Rapid, accurate indexing to .001", 3 to 100 stations. Even or uneven index patterns. 16" to 48" diameter.

Steel bases. Stress relieved, sandblasted, machined, and painted to fit your application.

Send us a print of your part, and ask for a profit prediction.

THE AVEY DRILLING MACHINE COMPANY

CINCINNATI 1, OHIO



Man, oh, man

ABRASIVE!

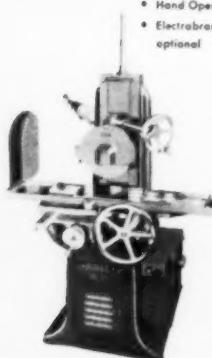
A typical topper from the trade . . . from "slickest, smoothest, easiest . . . to most accurate, most convenient, most valuable!"

It's easy to see why Abrasives turn precision grinding into an effortless pleasure for the man who prides himself in the finest, most accurate work.

In tool rooms, shops, and production lines, Abrasives exceed the heaviest demands. Company management appreciates Abrasive's sensible economy. Production management can count on speed, precision accuracy — plus — easy, infrequent maintenance. And most important, machinists, tool makers and mechanics, from masters to apprentices, enjoy Abrasive's simple, tireless operation and easy accuracy.

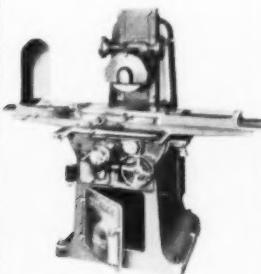
Here's the **ABRASIVE LINE** . . .

No. 1½ Surface Grinder
10" x 15" x 12"
• Hand Operated
• Electrobrasive control, optional



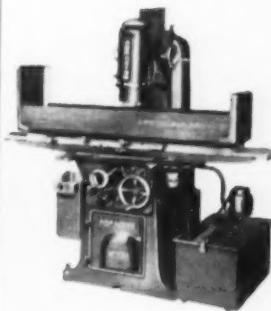
The biggest little grinder for the money.

No. 38 Surface Grinder
8" x 24" x 12"
• Automatic or manual feed
• Power or belt-driven spindle



For production and toolroom grinding.

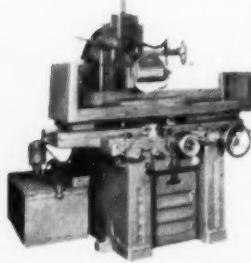
No. M34 Surface Grinder
8" x 24" x 12"
• Automatic feed
• Vertical spindle



Fast, economical for high production.

The ABRASIVE line...engineered for accuracy, speed, economy, ease of operation!

No. 1224 Hydabrasive
12" x 24" x 12"



The Hydabrasive 1224, plus Hydabrasives 824 and 1218 (not shown) are hydraulically operated for smooth, easy, vibrationless operation. Hydraulic units are rubber mounted on casters for effortless removal through the front of the machines. For the heaviest grinding loads, all have rugged motorized spindles. Abrasive's precision screw feed and ball bearing saddle ways assure precise transverse adjustment, absolute accuracy. These features, plus automatic feeds and simplified controls have made the Hydabrasives first choice of thousands.

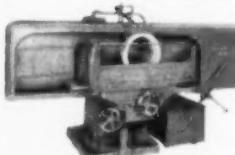
YOURS FREE!

Fully illustrated catalogs describing the complete Abrasive precision surface grinder line, including machines not illustrated here. This information is yours for the asking. Your name and address on a two-cent post card will bring this colorful new literature to you by return mail.

For Forty Years . . . First for Accuracy, Economy

For more data circle 312 on Reader Service Card

No. 18 Face Grinder
18" Wheel
• Motorized spindle
• 24" table travel



Finest for Castings, Dies,
Ceramics, Flat Surfaces



NEW ABRASIVES COMING

This new name plate gives you a hint. This year, look for new machines, new ideas, new developments from Abrasive.

ABRASIVE

ABRASIVE
Machine Tool Company
East Providence, Rhode Island

GISHOLT DYNETRIC
TYPE "U" BALANCER

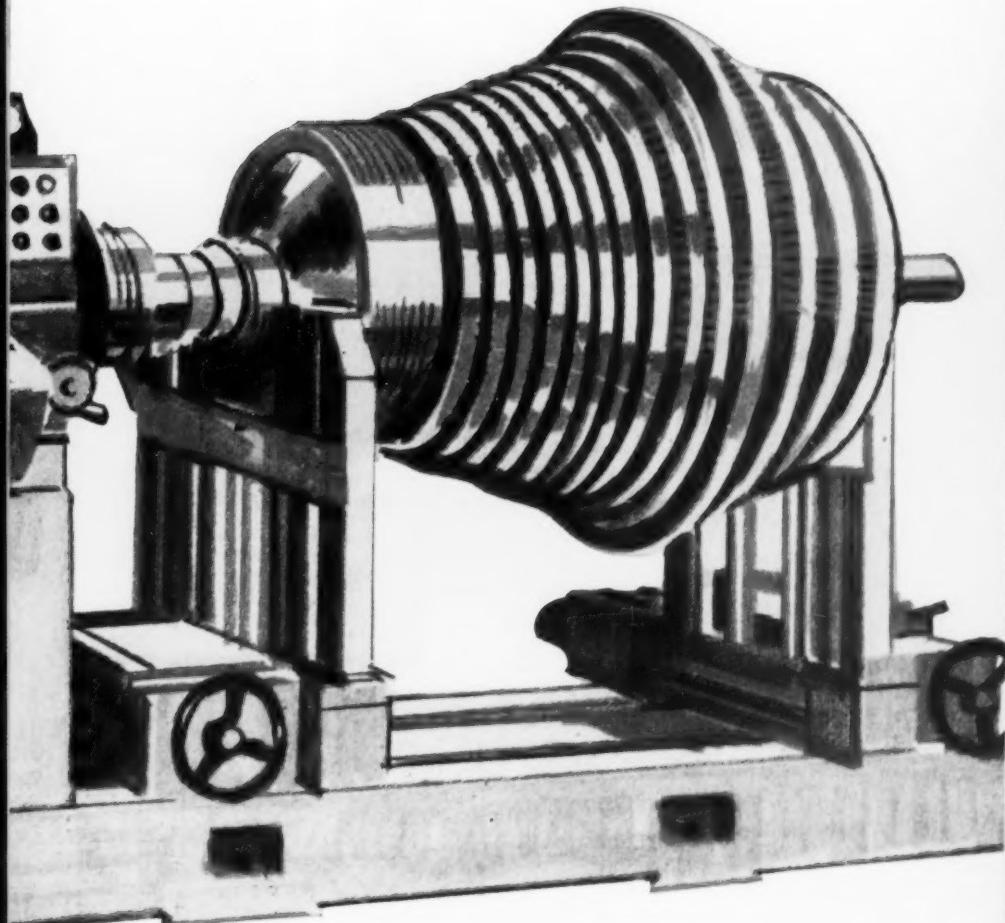




This latest design Gisholt DYNETRIC Type "U" Balancer has many outstanding features for quicker setup and faster, easier operation. Unbalance effects are accurately measured and located by unskilled operators. No computation is required—no charts or graphs. In short, here is a truly advanced design for better work at lower cost. If you're interested in the balancing of rotating parts or assemblies, large or small, let us tell you about these new machines—and show you how they may be applied profitably to your manufacturing processes.

Gisholt Machine Company, Madison 10, Wisconsin

Look ahead—keep ahead—with Gisholt



WORTH THEIR

Fellows
Lead Measuring
Instruments



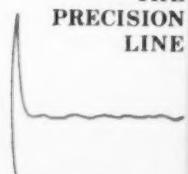
Fellows
Involute Measuring
Instruments



SEE FELLOWS
AT THE ASTE SHOW
—BOOTH 544
International Amphitheatre
CHICAGO
MARCH 19th - 23rd



THE
PRECISION
LINE



WEIGHT IN PROFITS

Fellows Gear Inspection Instruments with Chart Recorded Proof of Gear Accuracy

Deviations of the "red line" on a chart from a Fellows Gear Inspection Instrument, not only warn of costly gear errors—but indicate the nature of that error. Proper adjustments can thus be made immediately before expensive rejects accumulate in long production runs.

The use of Fellows Gear Inspection Instruments to continually "spot check" gears keeps waste of time, labor and materials to a minimum... provides undeniable chart recorded proof of gear accuracy... guarantees superior performance for the life of your product.

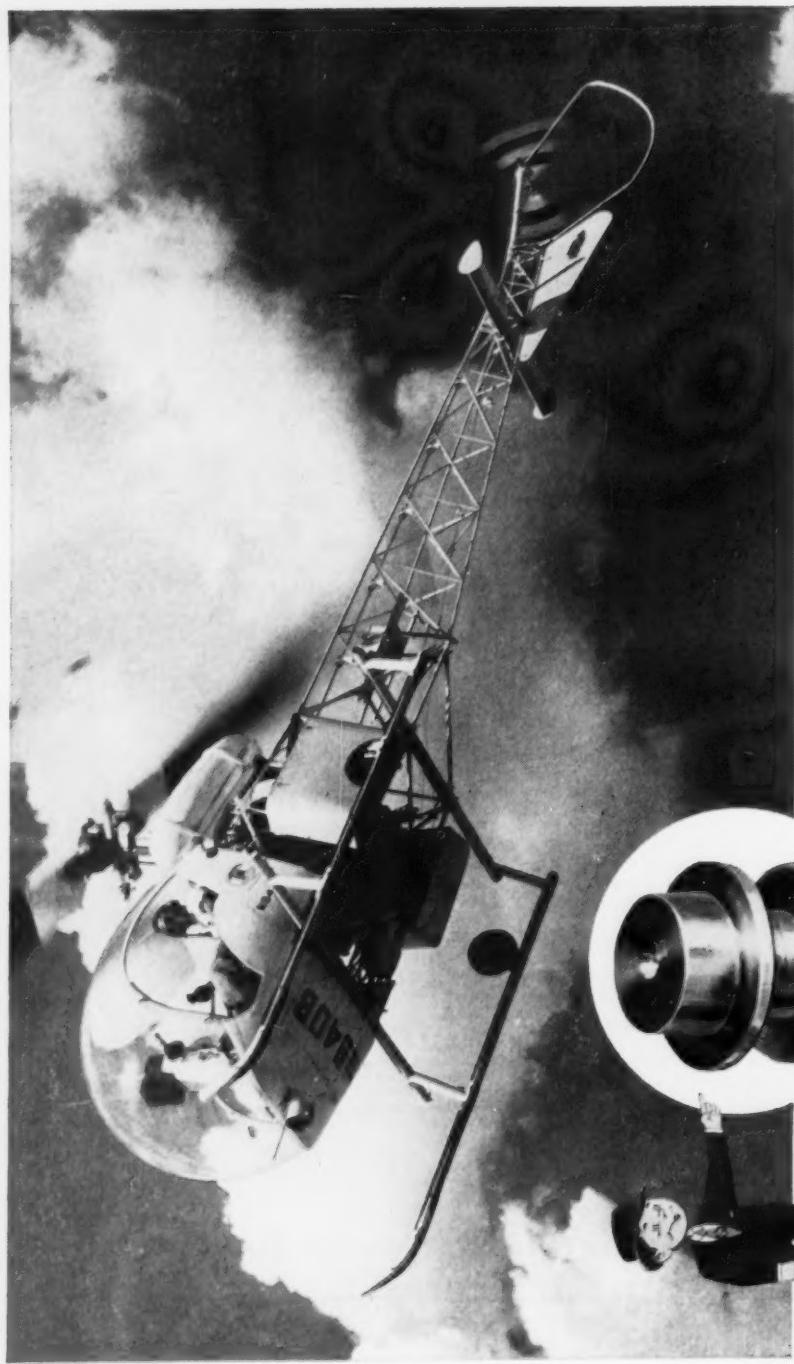
- **For composite check,** FELLOWS RED LINERS record gear errors in combination on a chart as the precision master rotates in intimate contact with the gear being checked. 3 models to 18" p.d.
- **For checking lead,** FELLOWS LEAD MEASURING INSTRUMENTS check various leads—also crown and taper. No involved calculations require. Errors charted by an electronic recorder at 500 to 1 magnification. 12", 24" p.d. models.
- **For checking involute profiles,** FELLOWS INVOLUTE MEASURING INSTRUMENTS check accuracy of involute profiles—also location of involute modifications. Electronically provide charts at 500 to 1 magnification. 12", 24" p.d. models.

There's a Representative in any Fellows office who will be glad to show you how to operate Fellows Inspection Equipment...and just how, in your operation—Fellows Gear Inspection Instruments can be "worth their weight in profit".

THE FELLOWS GEAR SHAPER COMPANY
78 River Street, Springfield, Vermont
Branch Offices: 319 Fisher Building, Detroit 2
5835 West North Avenue, Chicago 39
2206 Empire State Building, New York 1
6214 West Manchester Avenue, Los Angeles 45

Fellows *Gear Production Equipment*

"Mission accomplished" at Bell Aircraft...with FIRTHITE TXH



133% more needle bearing pins per grind

133% more needle bearing pins per grind

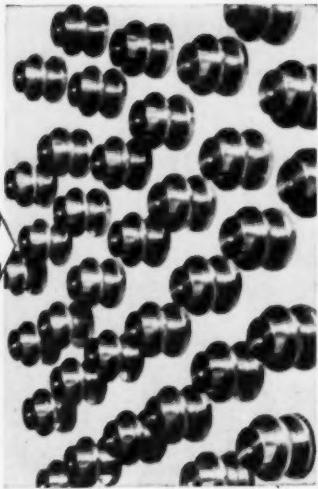
Down Fort Worth way at famous Bell Aircraft Corporation, they made production tests on the new FIRTHITE TXH Carbide . . . turning and facing needle bearing pins from SAE 4140 steel. The results speak for themselves:

- 133% more bearing pins per grind.
- More than twice as many pieces per grind as nearest premium grade.
- Seven times more pieces per grind than two other competitive grades.
- Only .007 stock removed to resharpen compared with .025—.035 for competitive grades.

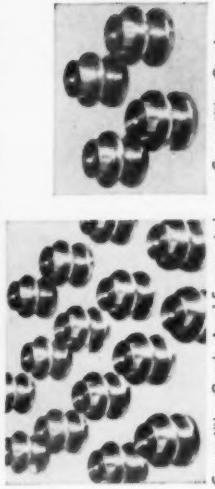
Truly this test proves, as do others all over the country, that FIRTHITE TXH is easily the outstanding carbide in its field . . . a *premium grade* at *no* premium price.

Yes, FIRTHITE TXH is a completely *new* carbide concept . . . a combination of materials and processes designed specifically to do heavy-duty, high-production cutting operations better than they have ever been done before!

You, too, can make important savings, and increase production with TXH. It's available *now* in all standard tips and tools. Try it today.



FIRTHITE TXH—35 PER GRIND



Competitive Grade A—15 per grind

Competitive Grades
B & C—4-5 per grind

Firth Sterling

—INC—

GENERAL OFFICES: 3113 FORBES ST., PITTSBURGH 30, PA.

MILLS: MCKEESPORT, TRAFFORD, DETROIT, HOUSTON
OFFICES AND WAREHOUSES: BIRMINGHAM, CHICAGO, CLEVELAND, DAYTON, DETROIT, HARTFORD,
HOUSTON, LOS ANGELES, NEW YORK, PHILADELPHIA, PITTSBURGH, WASHINGTON, WESTFIELD, N.J.

VISIT BOOTH NO. 528 A.S.T.E. SHOW

PRODUCTS OF FIRTH STERLING METALLURGY

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| High Speed Steels | Sintered Tungsten Carbides | Firth Heavy Metal |
| Tool & Die Steels | Chromium Carbides | High Temperature Ceramics |
| Stainless Specialties | | Zirconium |
| High Temperature Alloys | | |
| | | |



R 316

hydraulic triple circuit

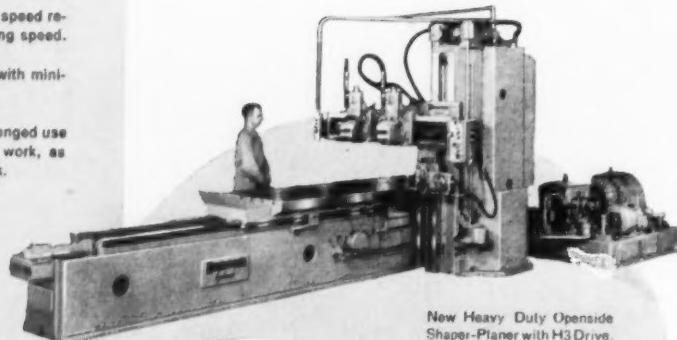
Infinite Speeds from 10 to 300 fpm., stepped through 3 distinct cutting force ranges.

Pendant control of cutting speed selection.

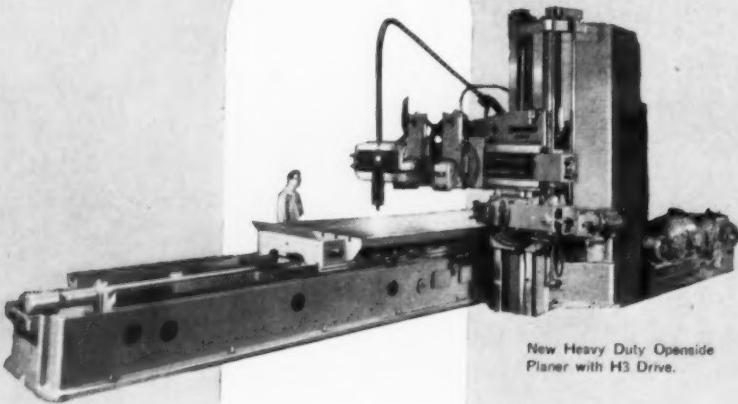
Maximum return speed regardless of cutting speed.

Quick reversals with minimum overtravel.

Suitable for prolonged use on short stroke work, as well as long work.



New Heavy Duty Openside Shaper-Planer with H3 Drive.



New Heavy Duty Openside Planer with H3 Drive.

For more data circle 320 on Reader Service Card

provides 3 distinct drives in a single machine!

h3 drive

machines free-cutting metals at high cutting speeds
machines average metals at average cutting speeds
machines tough metals with slow, heavy cuts

Hydraulic drive and feed inherently provide efficiency and ease in planing and shaping metal. Now a new dimension has been added to this proved efficiency and economy of hydraulic power. This exclusive new feature on Rockford Hydraulic Planers is called h3 drive—a triple hydraulic circuit to provide the correct combination of cutting speed and required force to most economically machine materials from the free cutting types to the toughest steels.

Many plants, large and small, who are evaluating their present production equipment will find the h3 drive a significant development in their plans for plant modernization.

We invite you to get full details on this new hydraulic achievement from any Rockford Machine Tool Co. representative, or write directly to us.

ROCKFORD MACHINE TOOL CO.
2500 KISHWAUKEE STREET • ROCKFORD, ILLINOIS



*it takes
top
equipment
to cut
the best
gears*

**BARBER-
COLMAN**
offers



Superior Hob Accuracy

As a result of long experience and skill in hob manufacture, Barber-Colman offers a new concept of ultra-precision in hob tolerances. An example is a 48 DP Class AA hob, ground to total allowable lead variation of .00015" tooth-to-tooth, .00015" in any one axial pitch, and .0003" in three axial pitches. Tolerances such as these are only practical where machine and hob sharpening have equally close tolerances. We suggest you contact our engineers for recommendations when you have jobs requiring hobs of this accuracy.

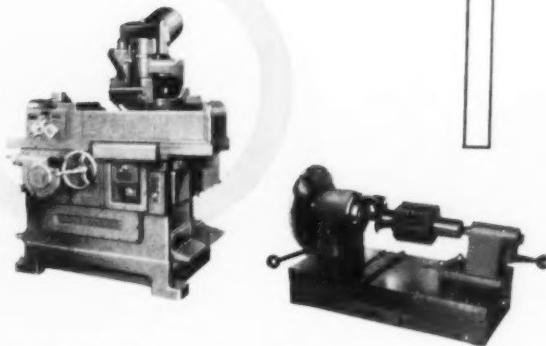
For production hobbing, Barber-Colman makes Class A, Class B and Class C hobs. Classes A and B are ground on the form and are recommended for accurate finishing and semi-finishing. Class C Accurate Unground hobs are used primarily on preshaved gears. All hobs are well within the standard tolerances for their particular class and pitch.

Automated Gear Production

For high speed, mass-production gear problems, Barber-Colman engineers have developed fully automatic hobbing machines, including magazine or hopper-feed loading, fully automatic cycle and automatic hob shifting.

For maximum production of specific parts, machines are designed with special purpose tooling, loading, gaging and handling to suit the requirements for accuracy and finish. Such machines may also include inspection, rejection, and size-gaging as part of the automatic cycle.

General purpose hobbing machines are available for hobbing parts up to 16" diameter, from 3½ DP to the finest pitches. A variety of special tooling can be furnished—hydraulic, pneumatic, electric—to give maximum accuracy and production efficiency for the particular problem.



Controlled Hob Sharpening

The inherent accuracy in Barber-Colman hobs and hobbing machines may be upset if all factors are not in adjustment. A common cause for loss of accuracy is error in resharpener hobs. To provide positive sharpening control on a production basis, and to insure maximum accuracy in sharpening, Barber-Colman engineers have developed a series of automatic sharpening machines. With these machines the sharpening operation becomes simple, fast and convenient, and original tool accuracy is easy to maintain.

Hob Sharpening Inspection

The Barber-Colman Hob Sharpening Checker is a precision instrument for measuring the accuracy of face sharpening on straight and helical fluted hobs. The precision found in Barber-Colman hobs is inherent and the only place it can be lost is in the sharpening operation. Reasonable in cost, this checker furnishes a convenient method for checking the sharpening accuracy.

Gear Cutting Service

Barber-Colman hobbing engineers, backed by years of experience in the field, and special skills acquired in production hobbing of gears, are available without cost to analyze and make recommendations on gear problems. This service will help to maintain peak efficiency in your gear cutting operations. Send us inquiries about accuracy, tooling, production and special tooth-forms.

BARBER-COLMAN COMPANY

643 ROCK STREET • ROCKFORD, ILLINOIS

Hobs • Cutters • Reamers • Hobbing Machines • Hob Sharpening Machines

For more data circle 322 on Reader Service Card

March, 1956

modern machine shop 23



Never Confuse the No. 8 MARVEL with an ordinary Band Saw

...only the MARVEL is Universal



Only a No. 8 MARVEL can do all of these things: Snip-off a $\frac{1}{8}$ " rod or cut-off an 18" x 18" cross section.



Rough to Size and Shape



Miter



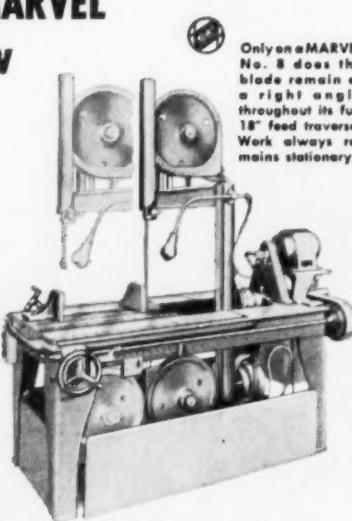
Index



Cut off and shape Structural Beams



Only on a No. 8 MARVEL can the saw column be instantly indexed and locked at any angle from 45° right to 45° left, and the saw then fed thru the work at the desired angle — without moving the work.



Only a No. 8 MARVEL has the large T-slotted work table, with removable quick action vise, that permits accurate set-ups of work of unrestricted sizes and shapes, special fixtures; etc.

"Rough Machine" to size and shape with minimum chip waste

The No. 8 MARVEL is the "busiest tool in the shop" wherever installed because it is a *universal* tool—has both the capacity and the versatility to handle not only standard sawing jobs but innumerable "trick" and convenience jobs as well. More than a metal saw, the No. 8 MARVEL is a fine machine tool with machine tool features like: Both power and hand feeds; Depth Stops; Automatic Blade Tension; Built-in Coolant Pump; Three operating speeds (or six with 2-speed motor). Moisture-proof electrical controls that conform to both "J.I.C." and "MACHINE TOOL" electrical standards; Dirt-proof ball bearings, etc.

If you cut, machine or fabricate metal, this is a sawing machine you should know about. Write for catalog.

MARVEL Metal Cutting
SAWS.
Better Machines-Better Blades

ARMSTRONG-BLUM MFG. CO. • 5700 West Bloomingdale Avenue • Chicago 39, U.S.A.

For more data circle 323 on Reader Service Card

the ONE COMPLETE Tool Line



Yes, one look at Davis and you're sure to agree that here is industry's most complete standard tool line. One quick check of its unparalleled range of types, sizes and cutter materials will convince you that only Davis offers the full advantages of one-source buying for all your boring, turning and planing requirements.

Here, too, at Davis you'll see designs from the one engineering group with the vision and background of metal working experience to produce special tooling of outstanding efficiency. So whatever your needs . . . at the show and in the shop . . . it's always good advice to see Davis first for the best in tooling.

DAVIS
BORING TOOL DIVISION OF
Giddings & Lewis Machine Tool Company
Fond du Lac, Wisconsin

THE ONE NAME THAT CERTIFIES ULTIMATE PRECISION AND PRODUCTIVITY IN TOOLING

Booth 489

CHICAGO'S
INTERNATIONAL
AMPITHEATRE

Introducing new ROTARY



streamlined TORRINGTON SWAGING MACHINES

featuring...

- maximum capacity for size and power
- convenient location of controls

- easy access for maintenance
- integral storage space
- modern styling and color

Styled in keeping with the dynamics of industry today, each new Torrington Swaging Machine embodies many engineering and design improvements.

Over-all dimensions of dies, backers, rolls and flywheel have been carefully engineered to provide the greatest swaging capacity possible for given machine size and horsepower. Moving parts are made of the finest grade tool steel hardened and finished by the most advanced methods. Special grade Krupp steel materially improves life of inside rings.

Controls, gatehandle and flywheel guard opening are

located on the left side of each machine for easy, natural operation. The new base design allows ready access to power and drive mechanism for easy maintenance.

Scientifically styled to eliminate the distraction of moving parts, the machines also embody improvements that subdue noise.

Whether you are pointing, tapering, reducing or shaping rod or tube, do it the *modern* way by swaging... on a streamlined Torrington Rotary Swaging Machine. For complete details, please write.

THE TORRINGTON COMPANY

Swaging Machine Division
730 North Street, Torrington, Conn.

See the new streamlined
TORRINGTON ROTARY SWAGING MACHINES
at Booth 219, ASTE Exposition in Chicago, March 19 to 23.

| Model Number | Work Diameter Solid* | Tube |
|--------------|----------------------|------|
| 100 . . . | 1/16 | 1/4 |
| 111 . . . | 1/8 | 5/16 |
| 211 . . . | 3/16 | 1/2 |

Three light-duty Swaging Machines are available complete with motor and stand containing storage space for dies and tools. New stand design permits operator to sit at his work. These models are also supplied without stand, hood or motor for use as bench machines.

| | | |
|------------|-----|-------|
| 312 . . . | 3/8 | 7/8 |
| 423 . . . | 5/8 | 1 1/2 |
| 1023 . . . | 1 | 1 1/2 |
| 434 . . . | ** | 2 1/2 |
| 436 . . . | ** | 2 1/2 |
| 438 . . . | ** | 2 1/2 |

New Streamlined Torrington Swaging Machines are available in any of six heavy-duty models for swaging of larger size solid and tubular stock.

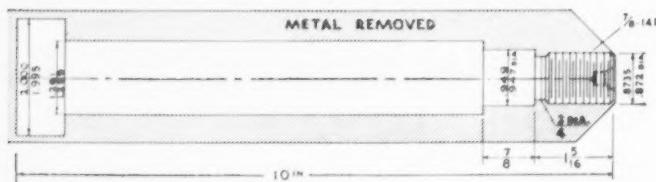
* Solid diameter capacities listed as a general guide only. They can be exceeded depending on type and hardness of material and extent of reduction.

** For capacity on solid work, refer to Torrington Engineering Department.



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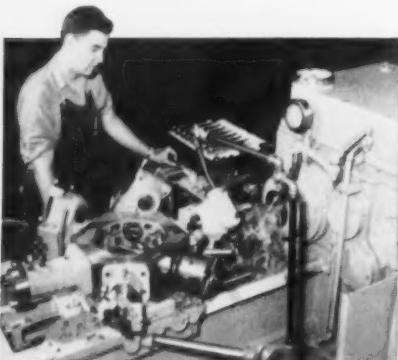
HERE'S REAL BREAD-AND-BUTTER PRODUCTION!



Warner & Swasey 1-A combines power and instantaneous speed changes with standard tooling for top efficiency on this small lot job.

The practical shop man knows that, after all the smoke has cleared about fancy attachments and special tools, most small lot work depends on his real "bread and butter" producer—the versatile, standard-tipped turret lathe.

And here's a typical small lot job, a 10-inch pinion shaft, that demonstrates this point. It requires the flexibility of standard tooling, power to really hog metal, and a fast selection of the most efficient cutting speeds. A new Warner & Swasey 1-A Extra Heavy Duty Turret Lathe, equipped with standard tools, does the job in $4\frac{1}{2}$ minutes—*real metal turning efficiency!*



YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS...WITH A WARNER & SWASEY

For more data circle 327 on Reader Service Card

28 modern machine shop

It requires a variety of cuts with 7 speed changes. The 1-A's 16-speed, all-clutch head, with its pre-selector, delivers them instantaneously!

First cut in this high carbon steel shaft is taken with a standard single cutter turner, using a carbide cutter. It is $1\frac{1}{2}$ -inch deep and consumes 30 horsepower! Second and third turning cuts are also taken with single cutter turners, using cutters with mechanically-held, throw-away carbide tips.

Two speed changes are made during the cutoff operation, again showing the advantage of instantaneous speed changes under cut, without effect on the carbide cutter.

Traditional Warner & Swasey ease of machine handling, enhanced by the new hydraulically-operated collet chuck and bar feed, not only cuts cycle time but cuts operator fatigue—puts more pieces on the floor at the end of each day!



March, 1956

NOW— Two Production Tools for the Cost of One!

Now you can get two machines for the cost of one—a driller and tapper—all in the same automatic Dumore unit. What's more, you can mount work close to the fixture with little tool travel and get faster cycling... less unproductive idling time!

The reversing motor on the Dumore Drill-N-Tap Unit reduces wear and eliminates expensive clutches. In most instances, you can tap with the same drill fixtures and set-up by simply removing drill bushing. Just flip the control switch for either tapping or drilling. Tap fits into chuck—no extra tapping head is required.

WRITE FOR FURTHER DETAILS AND WHERE TO GET IT!

Find out how our service engineers can cut costs and increase your drilling and tapping production...

Visit the Dumore Booth No. 678, ASTE Tool Show March 19-23, International Amphitheater, Chicago.

You Can Save Hundreds of Dollars in First Cost Alone,
With any of These DUMORE Automatic Drill Units.

SERIES 24 — Fully automatic with all controls built-in. Mounts in any position—vertical, horizontal, radial. Easily transferable from job to job.

SERIES 26 — Identical in size and capacity to Series 24, with just basic controls built-in for long, uninterrupted production runs.

AUTOMATIC DRILL HEAD

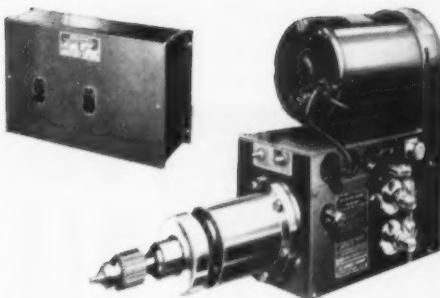
SERIES 20
For high production drilling of small parts.
No. 80 to 3/32" drill capacity.



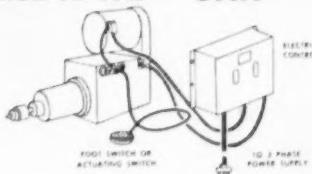
DRILL GRINDER SERIES 21
For fast, accurate sharpening of all 2-lip twist drills—No. 70 to 1/4", including crankshaft. Grinds included angles 90° to 150°, clearance angles 5° to 15°.

For more data circle 328 on Reader Service Card

March, 1956



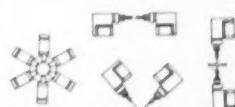
THE
New **DUMORE** **SERIES 28**
"DRILL-N-TAP" UNIT



CHECK THESE OUTSTANDING COST SAVING FEATURES

- No clutches to wear and replace
- Quick set-up on job after job
- Mounts practically anywhere—quickly
- Drills or taps at flip of a switch
- For long and short runs
- Utilize same set-up for drilling and tapping
- Spindle speeds—265 to 4900 R.P.M.
- Also mounts on standard drill press column for single spindle automatic driller and tapper

Unique nose mounting device for set-up in any position.



... helps you get increased production and lower job costs. Write for FREE Dumore Application Analysis Kit.

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AUTOMATIC DRILL UNITS
TOOL POST AND HAND GRINDERS

1302 Seventeenth St., Racine, Wisconsin

HOW YOU CAN SAVE THIS ALL-PURPOSE

ANOTHER
DENISON
FIRST



SIMPLE TO INSTALL
Only 24" high, 12½" wide,
19½" deep.

EASY TO SET UP
Ram pressures to one-ton
with peak operator safety.

**8" OF DAYLIGHT
WITH 3" STROKE**
for easy setup of dies and
fixtures.

MONEY WITH PRESS

New! 1-TON DENISON Hydraulic Multipress[®] featuring pressure reversal

Industry's most versatile production tool that:

SIMPLIFIES OPERATIONS because Multipress cuts down operator fatigue. There is no pulling of levers . . . no kicking pedals.

INCREASES PRODUCTION because Multipress cycle time is faster.

PRODUCES HIGHER QUALITY WORK because ram pressure and time dwell are precisely duplicated on every stroke.

IS COMPLETELY SAFE TO OPERATE . . . safeguards against accidental tripping.

And gives you these plus benefits:

Precision ram alignment with tools and fixtures.

Faster setup with plenty of daylight. Easier adjustment of ram pressure.

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Type of Operation

- Assembly
- Marking
- Punching
- Trimming
- Broaching

Type of Material

- Steel
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Hollow Mill Maker finds

DBL-2
High Speed Steel

HARD, TOUGH and VERSATILE



The maker of these adjustable hollow mills required a steel that would give top performance in a variety of jobs—turning, tapering, facing, chamfering and trepanning. After thorough testing, Ludlum's high speed DBL-2 was selected.

DBL-2 is an improved general-purpose high speed steel. It contains tungsten, molybdenum and vanadium in such proportions that it excels 18-4-1 for most applications. DBL-2's unusual combination of high hardness with toughness, its ability to hold a fine grain over a wide hardening range, and the fact that it easily machines many diverse types of stock, made it particularly well suited for this job.

In addition to these advantages, DBL-2 can be heat treated in the same furnaces and atmospheres as 18-4-1 without fear of harmful decarburization. These DBL-2 blades were heated to 2250 F, oil quenched and drawn twice at 1025 F. After heat treatment, blades easily machined such stock as aluminum, stainless steel, carbon steel, aircraft steel, plastics, bronze, screw stock, cast iron and brass.

There is an A-L tool steel to meet your toughest requirements. Call your A-L representative or distributor today . . . or write *Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pennsylvania.*

Write For Copy of

"CUTTING TOOL MATERIALS"

This 36-page illustrated booklet analyzes and compares various steels and covers grade selection for all major classes of cutting tools, etc., invaluable data for production men. Write for your copy today.

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March 1956 Issue

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modern machine shop

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Cincinnati 2, Ohio

Fourth Cover

Third Cover

Second Cover

First Cover

421

451

541

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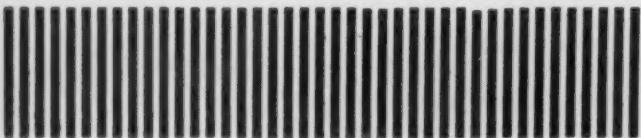
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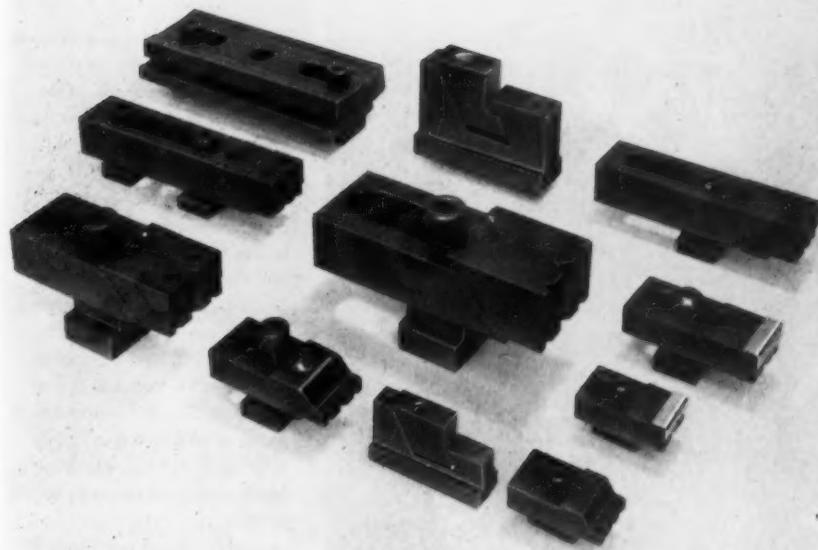
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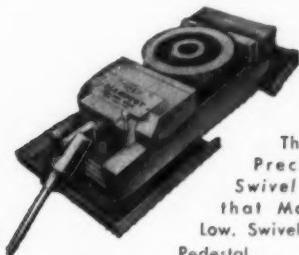




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The only
Precision
Swivel Vise
that Mounts
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today for free literature.**

WHEEL DRESSERS JAW CLAMPS - PRECISION VISES - DOWN HOLDING DEVICES

J & S TOOL CO., INC.

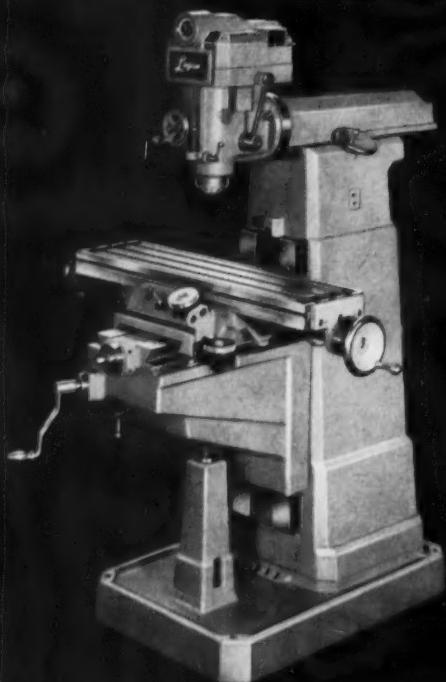
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*is more than NEW...
it's years ahead!*



*For full details and specifications see
your Logan dealer, or write for Bulletin*

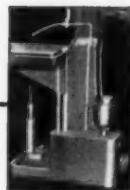
LOGAN ENGINEERING CO.
4901 West Lawrence Ave., Chicago 30, Ill.

Your Logan Dealer invites your inspection of a really new idea in Vertical Milling Machines. The most up-to-date principles of machine tool engineering are incorporated in the Logan Mill's advanced design and rugged construction. The motor in the base, for example, eliminates transmission of shock to the spindle. The large, heavily constructed ram provides 16" of clamping surface. The Variable Speed Drive offers infinite speed range of 80 to 570 rpm in low gear, and, by movement of a lever, a high gear range of 570 to 3800 rpm. The heavy, precision ground quill has a 5" travel, and the spindle revolves on precision ground, pre-loaded ball bearings. The operator has instant selection of the proper feed and speed with no belt changes. All these features and advantages can be purchased in the same price range as mills of similar capacity on the market.

BRIEF SPECIFICATIONS

SPINDLE SPEEDS . . . Infinite, 80 to 570 rpm in low gear, and 570 to 3800 rpm in high gear . . . infinite quill feed, 0 to .008" per revolution . . . 5" stroke . . . 360° head rotation . . . TABLE, 36" x 9" . . . three 11/16" tee slots . . . DRIVE, V-belt . . . 1½ HP, 3-Phase Motor

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Sensitive

DRILLING MACHINES

A FULL RANGE
DRILLING MACHINE
ENGINEERED FOR
PRODUCTION

■ Built carefully to provide the required accuracy for fine tool room work, Footburts Sensitives are designed with the weight and stability to maintain close tolerances on day after day production work. The correct speed for a wide range of drilling, reaming, and counter-boring operations is instantly available. Write for full information on this great line of Sensitive Drilling Machines. Built in 1, 2, 3, 4, 6 Spindle Models.

THE FOOTE-BURT COMPANY
Cleveland 8, Ohio

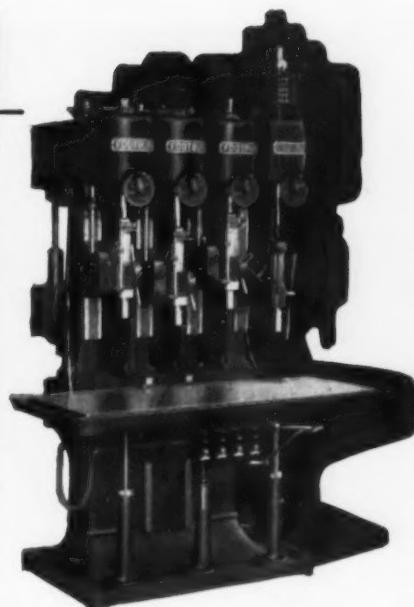
Detroit Office: General Motors Building

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*engineered
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FOOTBURT

MACHINE TOOLS

For more data circle 334 on Reader Service Card



■ No. 2 Machine with Back Gear • 12" Overhang • $\frac{3}{8}$ " Drilling Capacity in Steel • Optional Speed Ranges • 185 to 2300 RPM • 280 to 3450 RPM • Vertical Motor Drive with Standard Single Speed Motor • Power Feed Assembly • Tapping Attachment • Coolant Outfit.



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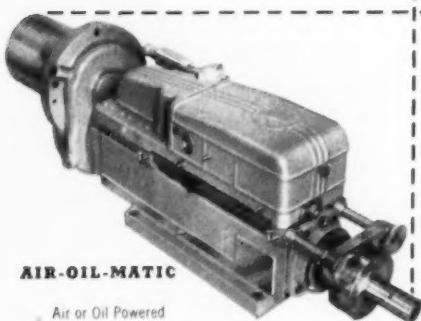
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BUILD YOUR OWN "Specials"



CAM-MATIC

- Mechanically Driven
- Electrically Controlled
- Rigid Quill Construction
- Exclusive Electric Clutch
- Adjustable Thrust Control
- Capacity to 1½", Stroke to 6"



AIR-OIL-MATIC

- Air or Oil Powered
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- Wide Range of Spindle Speeds
- Infinitely Variable Feed Stroke from 0" to 4½"
- 6" Maximum Stroke
- Convenient Feed and Stroke Adjustment

with

Morris
AUTOMATIC

DRILL UNITS

Whether you're building your own "special" production machine, organizing a completely automatic production line, or revamping drilling operations for more speed and higher efficiency . . . MORRIS Automatic Drill Units are flexible tools that assure improved drilling operation.

Choose from two basic types, in a variety of sizes and drives. Mount them in horizontal, vertical or angular positions . . . MORRIS Drill Units permit complete automatic control for precise drilling, reaming, tapping, spot-facing and allied operations.

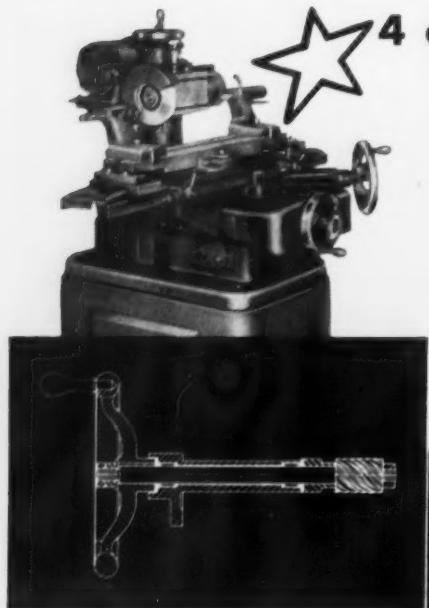
WRITE TODAY FOR DETAILED DESCRIPTIVE BULLETINS



Morris

MACHINE TOOL CO.
934 Harriet Street
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4 of the reasons why

EXCEL NO. 6

**UNIVERSAL CUTTER
and TOOL GRINDER**
is your best buy for keeping
your reamers and milling
cutters in first class
condition



S-M-O-O-T-H TABLE MOVEMENT

Hardened spiral teeth of
table control mesh smoothly
with rack gear of top table.

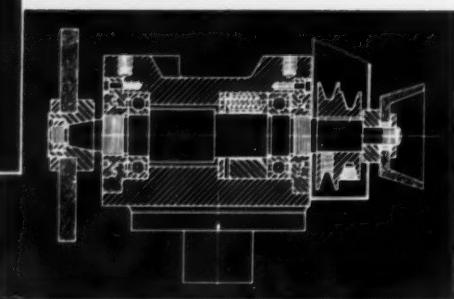


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Readily adaptable for these operations,
the versatile No. 6 will *wet*
grind, too.



LOW COST includes all standard
attachments—\$1,135.00, including
the pedestal.



AUTOMATIC TAKE-UP FOR SPINDLE WEAR

End play automatically taken up by
spring preloaded ball bearings,
eliminating wear. Spindle is full
 $1\frac{1}{2}$ " dia., finest alloy steel. One end
tapered to receive grinding wheel
collet, other end straight $\frac{1}{2}$ " to fit
small cup wheels.

For full details on Excel No. 6, write Dept. M-36.

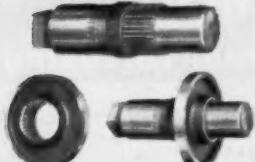
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GRINDERS

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HYDRAULIC & HAND FEED SURFACE GRINDERS • UNIVERSAL CUTTER & TOOL GRINDERS • DRILL GRINDERS

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NEW "PIN-TYPE" ARBORS



Permit you to hold squareness and concentricity in accurate relationship with the pitch line of an involute splined bore when facing or turning.

NEW "BETTER-HOLD" CHUCKS



Powerful, accurate centering fit applied easily to a shank-type cutting tool by twisting the "lock-and-eject" actuating ring. Permit quick, easy tool changes.

NEW SCULLY-DRIFT TOOLS



Simple, foolproof method for ejecting tools from a spindle or holder without hammering. Reduces tool breakage and damage to machine bearings.

SEE THEM AT THE A.S.T.E. SHOW

International Amphitheatre

NEW ACCURACY AND EFFICIENCY



FOR PRODUCTION AND ASSEMBLY

PRECISION HOLDING

HEADQUARTERS—BOOTH 488

Scully-Jones and Company, 1909 South Rockwell St., Chicago 8, Illinois

NEW "SAFE-TORQUE" NUT RUNNERS



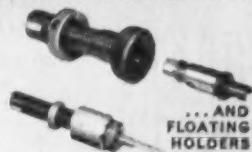
New, one-shot clutches for hand power tools or assembly machines permit you to tighten nuts consistently, with controlled torque, better than you can set them by hand.

NEW "SAFE-TORQUE" TAP DRIVERS



Performance-proved on hundreds of jobs, they eliminate or drastically reduce tap breakage, increase production, and improve quality. Provide accurate torque adjustments to suit job conditions.

NEW "LOCK-AND-EJECT" ADJUSTABLE ADAPTERS



... AND
FLOATING
HOLDERS

Improved collet action minimizes tool pullout. Operator merely turns the threaded nut to seat and unsat the chuck. Speed and simplicity tool changes. No pounding or torsion needed.

NEW RECESSING TOOLS



Give you high production and accuracy on wide variety of operations on standard machines. New grinding fixture provides accurate method for sharpening and measuring circular form tools.

NEW "ROLL-LOCK" TOOLS



Unique operating principle provides accurate centering shrink fit for chucking parts and tools. Expanding mandrels or compression-type chucks operate quickly by twisting actuating ring.

NEW "TOOLITROL" BOARDS

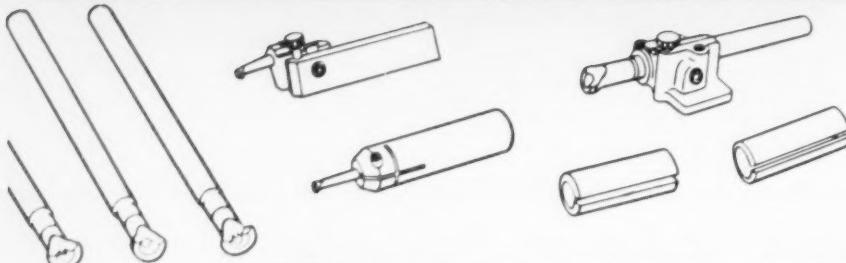


New tool control method coordinates and expedites at-the-machine problems of pre-setting, storing, and changing tools in multiple-spindle machines. Non-productive time is reduced.

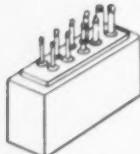
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Here's Everything

for Precision Boring and Internal Threading



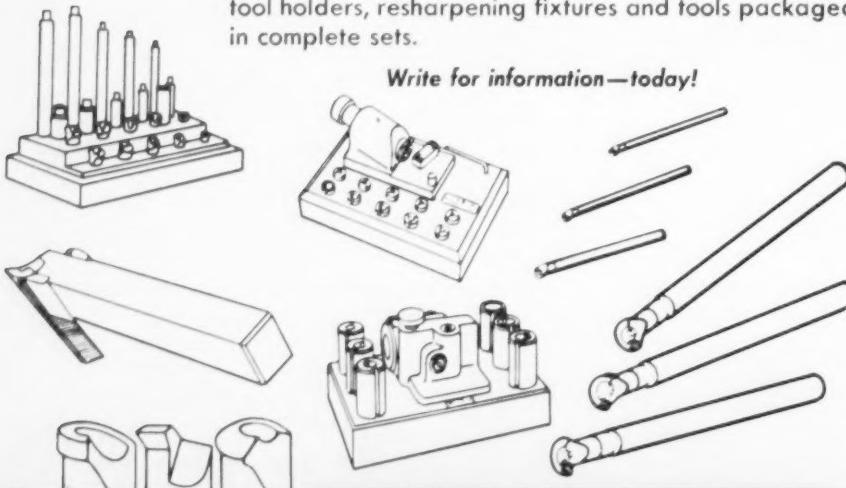
You'll find everything you need at Bokum for fast precision boring.



Due to the unique design—combined radial and helical back-off—Bokum tools provide constant clearance, permit faster machine operation. Resharpening is simple.

Bokum's new products include tools for cutting grooves for retaining rings and O-rings. Accessories include tool holders, resharpening fixtures and tools packaged in complete sets.

Write for information—today!



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BOKUM TOOL COMPANY, INC.

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WHY GROWL ...

... OVER YOUR GRINDING WHEEL PROBLEMS? You'll solve them easily when you switch to CINCINNATI (PD)[®] GRINDING WHEELS. Because now CINCINNATI Grinding Wheels offer POSITIVE DUPLICATION—the most talked about development in years. Positive Duplication is a remarkable achievement in precision manufacturing and quality control that can *save you money . . . and increase your production.*

Through the CINCINNATI (PD) Manufacturing Process you are assured Positive Duplication of the original wheel *every time you reorder.*

"On grade" with a CINCINNATI (PD) WHEEL means all future (PD) WHEELS will act and grind exactly alike.

Yet CINCINNATI (PD) WHEELS are priced no higher than ordinary wheels.

Let us sink our teeth into your grinding wheel problems and we'll have you purring like a kitten. Contact us and we'll send one of our representatives—men who know grinding and grinding machines as well as grinding wheels. Write, wire or telephone Sales Manager, Cincinnati Milling Products Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio. Remember . . . *only CINCINNATI Grinding Wheels give you . . .*



POSITIVE DUPLICATION

*Trade Mark Reg. U. S. Pat. Off.

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CINCINNATI[®]
Grinding Wheels

A PRODUCTION-PROVED PRODUCT OF
THE CINCINNATI MILLING MACHINE CO.

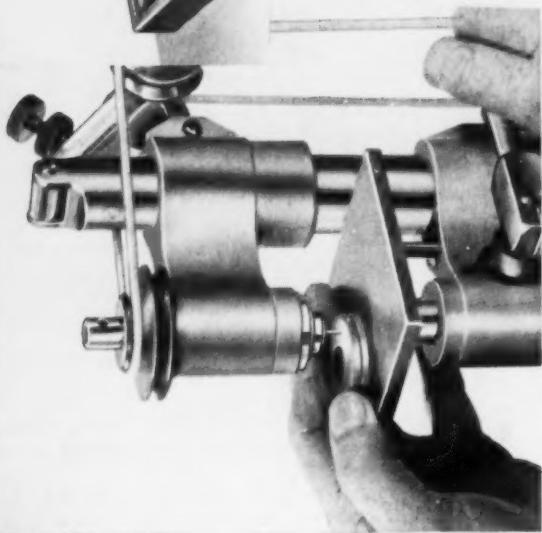
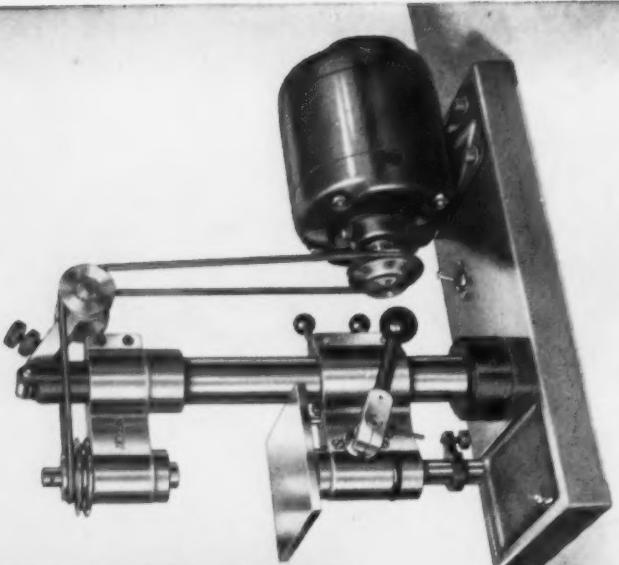
**SMALL DRILLS MUST BE HELD
IN PRECISION COLLETS TO ASSURE ACCURACY**

LEVIN[®] MICRO-DRILL PRESS

**FOR VERY SMALL HOLES
DOWN TO .002"**

In the LEVIN micro-drill press drills are held in precision collets. Runout is reduced to practically zero and drill breakage

from this cause is eliminated. Collets are available in a complete range of sizes down to .1 mm (.004").



Size of table is 3-3/4" x 4". Maximum table travel is 1-1/2". Greatest distance between table and end of spindle 4". Preloaded ball bearing spindle with four speeds 1725, 2600, 3000, 4700 RPM. Motor 1/2 HP, 110V, 60C. The micro-drill press may also be had with a 3450 RPM motor, doubling the above speeds.

Send for catalog M describing complete line of micro-drilling equipment, collets, instrument lathes and precision tools.

LOUIS LEVIN & SON, INC.
3610 South Broadway • Los Angeles 7, Calif.

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A SHORT CUT TO A FINISHED PRODUCT



SAVE YOURSELF TIME AND TOOL CHARGES

with Anaconda multiple-plunger press products—in a wide choice of metals

If you need parts like these in quantity, The American Brass Company can save you time and money. Through its specialized experience—and thousands of stock tools—it may save tool charges, too.

Ferrules, grommets, eyelets, deep-drawn cups and shells, and thousands of other intricate, close-tolerance parts made from strip metal are everyday business. American Brass Company design engineers and toolmakers have earned an en-

viable reputation for cutting costs and performing the almost impossible in design and production.

Your choice of metal: Such fabricated products can be furnished in copper, brass, bronze, nickel silver, nickel, iron, steel, stainless steel, and aluminum—in a wide variety of finishes.

Standard products: For a selection of more than 1000 eyelets of common sizes and styles, as well as eye-

lets kept in stock for immediate shipment, write for Catalog BG-1.

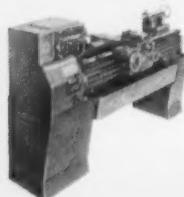
Special products: Just send a sample, drawing, or description, together with the quantity you need, the metal to be used, and other pertinent information. Address: The American Brass Company, Waterbury Brass Goods Division, Waterbury 20, Conn.

ANACONDA[®]
MULTIPLE-PLUNGER PRESS PRODUCTS

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The Right Lathe for You from LeBlond's Complete Line...

Regal Lathes



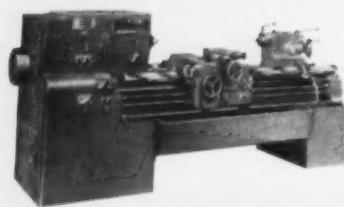
Dependable Performance at Low Cost

13", 15", 17", 19", 21", 24"; 2 to 5 horsepower

Designed and built like heavy-duty lathes, the new LeBlond Regals will give you a long life of precision production, minimum maintenance and the kind of dependability you'd expect from a much higher-priced machine!

Major features: Hardened and ground replaceable steel bed ways. Combination gear-belt drive headstock. Both feed rod and leadscrew. 3-bearing spindle. Advanced styling. Plus general construction details patterned after LeBlond heavy-duty lathes.

Small Heavy Duty Lathes



Stamina Plus with Precision

12", 14", 16", 20"; 7½ to 20 horsepower

LeBlond heavy-duty engine lathes have always been known for their outstanding stamina—the ability to stand up to the toughest turning jobs with precision, year after year. Our new machines in this class are the most rugged, yet precise that we've ever built!

Major features, 16" machine shown: Single-lever, four-way power rapid traverse built into the one-piece apron. Combination gear-belt drive headstock with 27 speeds from 16 to 2000 rpm. Totally enclosed quick-change box. Hardened and ground replaceable steel bed ways. Automatic lubrication.

Large Heavy Duty Lathes

Heavy Hogging or Fine Finishing with Ease

25", 32", 40", 50"; 50 and 60 horsepower

When large-swing work is in your production picture, check these big LeBlonds. Whether you need real high power, contoured shapes or fine finish, LeBlond offers the utmost in dependability, speed and easy operation.

Major features, 32" machine shown: Adjustable acceleration for starting, stopping, jogging provides true safety. 36-speed headstock, spur gear design for the lowest no-load friction horsepower. Four-way power rapid traverse (six-way on 40s or 50s). Generous proportions throughout for long-lived stamina and precision!

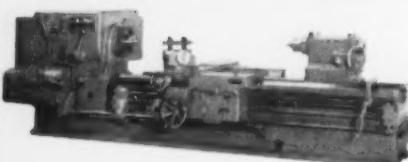
Sliding Bed Gap Lathes

Maximum Versatility with Dependability

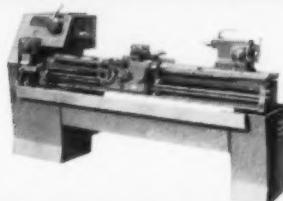
16", 18", 25", 50", 32", 60" Heavy Duties; 17", 28" Regal

Lathe department all rolled up in one machine! In addition to regular turning, facing, chasing, tracing, you can handle odd-shaped or large-diameter work as well as extra-long pieces.

Major features, 25"/50" machine shown: Sliding upper bed moves easily to provide variable gap or capacity for extra length. 36-speed high-power headstock. Special one-piece apron with extended length handwheel brings cutting tool close to gap. Four-way power rapid traverse.



Dual Drive Lathes



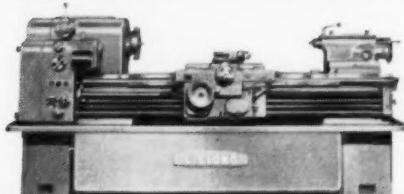
Best Buy for Medium-duty Turning

15"; 5 horsepower

Dual Drive gives you efficient capacity for the great proportion of your lathe work. Smooth and powerful spindle speeds satisfy all requirements up to those requiring a heavy-duty machine. Precision production at moderate cost!

Major features: Single-lever choice of 16 spindle speeds from 31 to 2400 rpm through combination gear-belt drive headstock. Hardened and ground replaceable steel bed ways. Totally-enclosed quick-change box. Automatic lubrication. Double-wall, one-piece apron.

Model RT Toolroom Lathes



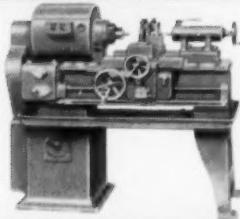
The Ultimate in Precision, Convenience, Versatility

16"; 7½ horsepower

Even today, other lathes can't match the advanced designs pioneered by LeBlond in the RT Toolroom Lathe. When it comes to producing a wide variety of fine toolroom work, no other lathe can match the convenience, precision and speed of the RT.

Major features: Infinitely-variable spindle speeds from 6 to 1500 rpm by a single lever. Universal quick-change box provides 90 feeds and threads. Four-way power rapid traverse. Combined feed apron cuts steep tapers. Automatic chasing stop limits cross slide travel, saves time in chasing threads.

Rapid Production Lathes



Best for Low-cost High Production

13", 17", 21"; 3 to 10 horsepower

Not a stripped down engine lathe, RP is designed to give you high production for a variety of work within a range you choose. A great number of productive attachments are available to suit your special needs.

Major features, 13" machine shown: Choose from three headstocks that give you speeds as low as 68 rpm and as high as 3600 rpm. Hardened and ground replaceable steel bed ways. Automatic lubrication to headstock and feed box. Heavy-duty carriage and apron.

LeBLOND also Builds:

Plain Bed Gap Lathes 12", 14", 16", 20", 25", 32"

Hollow Spindle Lathes 16", 20", 27", 30"

Toolroom Lathes 12", 14", 16", 20"

Standard Duty Lathes 20", 25", 32", 40"

Crankshaft Lathes Automatic—for any crank

Cutter Grinder

Hydra-Trace®

Duplicating Attachment Fits most LeBlonds built since 1935

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Write for complete catalog C-56

The R. K. LeBlond Machine Tool Company

Cincinnati 8, Ohio

World's largest builder of a complete line of lathes for more than 69 years

Representatives in principal cities throughout the world



outstanding
in **3** great
requirements

which are indispensable in
furnishing amazing speeds on
work of utmost precision . . .
LOWEST COST PER PIECE

LATHES

① GREATER RIGIDITY

② SIMPLICITY of CONTROL

and **OPERATOR CONVENIENCE**

③ PRODUCTIVITY

NEW

PRACTICAL . . . DEPENDABLE . . . DESIGNED

to do MORE for you at LESS COST. Built on the fundamental SIDNEY
principles which have won international fame.

since 1904 . . . improved to satisfy the demand of the present

and far into the future.



SIDNEY MODEL 32 ENGINE OR TOOL ROOM LATHE
EQUIPPED WITH SIDNEY FLUID TRACER

THE SIDNEY MACHINE TOOL CO. • SIDNEY, OHIO

Builders of Precision Machinery since 1904

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now...

ONE COMPLETE
REFERENCE FOR YOUR
ONE SOURCE OF
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ACCESSORIES

More than 200 pages featuring
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Danly's new "Leadership Line" of die sets and diemakers' supplies is a major development in the stamping industry — certain to affect every toolroom and die shop in the country.

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MORE CUTS PER BIT

because they're

BALANCED



duMONT TOOL BITS

*High Speed, Ground
Square and Rectangular*

Toughness is important in a tool bit. So is wear resistance. So is red hardness. But most important is the right combination of all three.

That's what you get in duMont Tool Bits — an almost perfect balance of these three qualities. The result is more cuts per bit, more cuts per dollar.

Try duMont Tool Bits and see what a difference "balance" can make.

Booth 1106 — A.S.T.E. Show

The du MONT CORPORATION,
Greenfield, Mass.

MAIL FREE Tool Bit COMPARISON
CHART, CATALOG and PRICE LIST
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Company.....

Address.....

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Meetings

Important Meeting Dates



March 14-16 • Pressed Metal Institute, Annual Spring Technical Meeting, Hotel Carter, Cleveland. Institute headquarters: 3673 Lee Rd., Cleveland 20, Ohio.

March 18-20 • American Machine Tool Distributors Association, Spring Meeting, Hotel Statler, Detroit. Association headquarters: 1900 Arch St., Philadelphia 3, Pa.

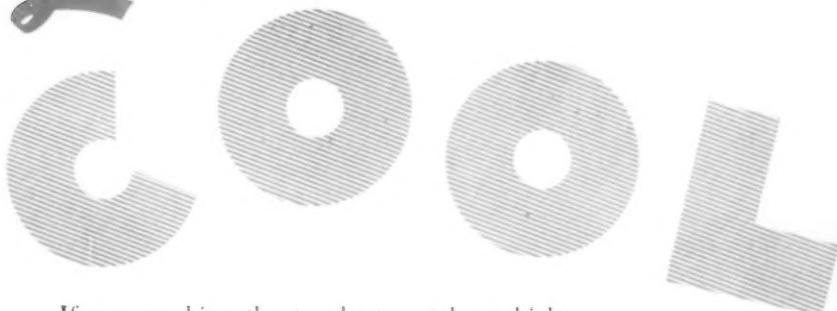
March 18-20 • Steel Founders' Society of America, Annual Meeting, Drake Hotel, Chicago. Society headquarters: 606 Terminal Tower Building, Cleveland 13, Ohio.

March 19-21 • American Society of Mechanical Engineers, Spring Meeting, Multnomah Hotel, Portland, Oregon. Society headquarters: 29 West 39th St., New York 18, New York.

March 19-21 • Society of Automotive Engineers, Inc., National Production Meeting and Forum, Hotel Statler, Cleveland. Society headquarters: 29 West 39th St., New York 18, New York.

March 19-23 • American Society of Tool Engineers, Industrial Exposition and Annual Convention, International Amphitheatre and Conrad Hilton Hotel, Chicago. Society headquarters: 10700 Puritan Ave., Detroit 38, Michigan.

Improved *Lusol* **KEEPS HIGH SPEED CUTTING**



If you machine the toughest metals at high production rates, particularly with carbide tools, you'll get better results with Lusol. This oil-free, chemical, transparent, metal-working solution has the highest heat-removing quality of any coolant *at the point of cutting*. Lusol's tiny droplets get right to that point, keep tools, work and chips cool. Tools last longer, finish is better, closer tolerances are possible in work pieces because uniform low temperature machining minimizes expansion and contraction. And Lusol is good to work with. It is a combination coolant, cleanser, rust preventive and water conditioner. It is non-irritating to the skin and does not cause odors or smoke. Users from coast to coast depend on Lusol — because it's BETTER FOR THE WORK AND BETTER TO WORK WITH. Write for complete information.

VISIT BOOTH 467—A.S.T.E. SHOW



BETTER PRODUCTS FOR BETTER METAL WORKING

F. E. ANDERSON OIL CO., INC.

PORLTAND, CONNECTICUT

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March, 1956

modern machine shop 49

THE *Lusol* LINE FOR BETTER METAL WORKING

Lusol
For tough metals, high speeds, heavy feeds. One product for both machining and grinding.

Lusol Super Concentrate
Double strength Lusol for minimum storage and handling.

Lusol K-7
For grinding. Combines cooling and lubrication.

Lusol Shamrock
An all around chemical emulsion.

Lusol Unikool
Universal low cost transparent coolant.

Lusol Machine Cleaner
Cleaner and germicide.

Lusol G-3 Germicide
Kills bacteria.

Lusol Tapcool
A series of threading and tapping compounds.

**Improve your product quality
with precision lapped parts!**



Enlarged Norton job lapping service

Complete and modern in every detail, the new Norton Job Lapping Department is ready to finish parts to your exact specifications.

Here, Norton machines for every type of lapping are operated by expert personnel. Results are checked on the latest inspection equipment, while precision accuracy is further assured by careful atmosphere control. Extensive job range covers the following:

Materials — Practically unlimited in range, including hardened steel, stainless steels, stellite facings, cast iron, non-ferrous pressed and die-cast parts.

Types of Lapping — Single and parallel face flat lapping, to specifications ranging from stock removal to optical flatness. Also, external cylindrical lapping to high precision requirements.

Workpiece Capacities — Flat work up to 24" across. Cylindrical work from $\frac{1}{16}$ " diameter by $\frac{3}{4}$ " long to 2" diameter by 8" long.

The entire project is under direct supervision of Norton Lapping Engineers, pioneers in the development of mechanical lapping processes and machines. They are prepared to work out the best lapping techniques for your requirements. For full details, see your Norton Representative or write us direct. NORTON COMPANY, Machine Division, Worcester 6, Mass.

To Economize, Modernize With NEW



Making better products... to make other products better

District Sales Offices: Hartford • New York • Cleveland • Chicago • Detroit
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For more data circle 349 on Reader Service Card

On small, flat parts the Norton Thru-Feed Lapper

brings
4 to 1
savings



Automatic Loading Arrangement of Norton 26 Hyprolap lapping machine makes sure parts are in correct position before entering feeding trough... prevents ganging up... directs work in a path that assures even lap wear.

Norton 26 Hyprolap Lapping Machine with automatic loading features that increase production of small, flat parts difficult to handle manually as much as 4 to 1... as many as 8000 pcs/hr.

*NEW, built-in automatic loading adds extra advantages to Norton 26 Hyprolap**

Now you can make 4-to-1 savings in lapping small parts... and get top-quality results on every job. Investigate new Norton 26 Hyprolap lapping machines with the exclusive built-in thru-feed mechanism.

Here's why:

1. *You speed up production.* Loading and lapping operations handle parts as fast as 8,000 pieces per hour.

2. *You cut handling.* Loading and unloading are completely automatic.

3. *You reduce downtime.* Work path traverses the entire working surface of each lap... promoting even wear... reducing the frequency of lap dressing.

4. *You cut out operations.* This lapper removes stock down to .0002" tolerances... makes surfaces parallel to .000025" in many instances without pre-grinding of parts.

5. *You use less skilled help.* Filling feed hoppers and removing finished-work baskets are the only manual operations.

No wonder 4-to-1 savings are a matter of record with the new Norton Hyprolap with built-in automatic loading!

Send for Bulletin 852-7. Also submit samples of your work for production estimates. Standard hopper-feed Hyprolap machines take work up to 1½" diameter. Modifications handle larger work. NORTON COMPANY, Machine Division, Worcester 6, Massachusetts.

To Economize, Modernize With NEW

NORTON

GRINDERS and LAPERS

Making better products... to make other products better

*Trade Mark Reg. U. S. Pat. Off. and Foreign Countries

For more data circle 350 on Reader Service Card

NEW *Grip-Tip* CENTERS

(Patented)

CHECK THESE *Grip-Tip* FEATURES

- Long-Life Holders
- Replaceable Carbide Tips
- Easy Insertion and Removal of Male or Female Tips
- Reduced Machine Down-Time
- Lower Cost for Replacement of Carbide Tips
- Carbide Tips Accurate to .0003"
- No Regrinding of Holder
- Carbide Tips Are Easy and Inexpensive to Stock
- Reduced Regrinding Time
- Longer Diamond Wheel Life



with

REPLACEABLE CARBIDE TIPS

Grip-Tip Centers are specifically designed to substantially reduce your replacement costs and machine down-time for regrinding or replacement of worn or chipped centers.

Male or female carbide tips are inserted or removed from the tool steel holders by simply turning a screw. The unique clamping action of holders on tips is positive and quick . . . you save replacement time with Grip-Tip Centers.

The life of Grip-Tip holders is practically unlimited, for, only the dull or chipped carbide tips are

reground. Because the steel holder is not ground when sharpening the carbide tip there is less clogging and longer life for your diamond wheels. Also, the relatively inexpensive double end tips in both male and female types can be stocked with a minimum investment . . . Grip-Tip Centers reduce tool and inventory costs.

Grip-Tip Centers increase your production by permitting full utilization of machine tools. It takes but a minute to remove old carbide tip and replace with a new one . . . machine down-time is less with Grip-Tip Centers.

For Further Information, Write to:

DETROIT REAMER & TOOL CO

780 W. MAPLE RD. • P.O. BOX 174 • BIRMINGHAM, MICH.

VISIT US AT THE A.S.T.E. INDUSTRIAL EXPOSITION — BOOTH 274

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modern machine shop

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modern machine shop
431 Main St. Cincinnati 2, Ohio

March, 1956



FAST DELIVERY . . .

from this medium-size Detroit stamping plant.

For value and service, Whitehead is your source. Any metal—any special material. Whitehead has dies on hand for O.D. sizes $\frac{1}{8}$ " to 18"; any I.D. you want; any thickness from .002" to $\frac{3}{8}$ ".

In stock: S.A.E. standard light, medium, and heavy steel washers; brass and copper, small and large patterns; bolt sizes.

Get this catalog for your files by writing Whitehead at Detroit.

55-4

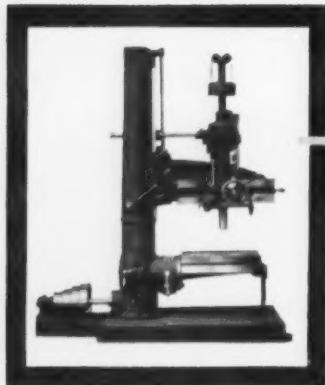


**WHITEHEAD
STAMPING CO.**

1673 W. LAFAYETTE BLVD.
DETROIT 16, MICHIGAN

For more data circle 352 on Reader Service Card

modern machine shop 53

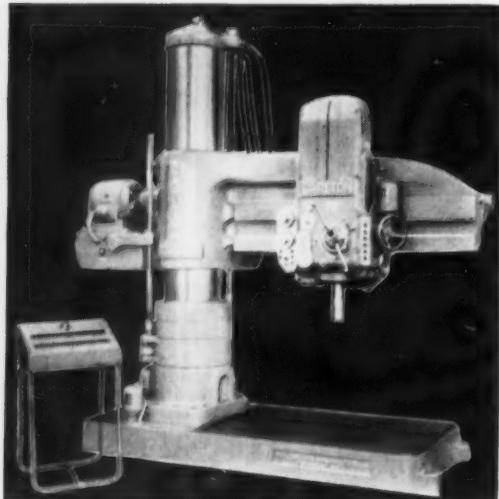


| CARLTON | 1916 Style D | 1956 Model 4A |
|--|-----------------|------------------|
| Speeds, number | 4 | 36 |
| Speeds, maximum, rpm | 450 | 2000 |
| Feeds, number | 1 | 18 |
| Main drive motor, hp | line shaft | 25 |
| Bearings, type | plain | anti-friction |
| Lubrication | manual | automatic |
| Spindle diameter at point of drive | 15/16" | 4" |
| Vertical travel of spindle | 8" | 20" |
| Traverse of head on arm | 40" | 58" |
| Traverse of arm on column | 32" | 44" |
| Shipping weight, lbs. | 3000 | 28,355 |

Carlton RADIAL DRILLS

continuously improved since 1916 . . .

*better than ever today . . . now available with
pre-selector and programming device*



The belt driven Style D Carlton radial drill (above)—an advanced design model when introduced in 1916—looks pretty old-fashioned today.

And indeed it is. For Carlton radial drills today are ever so much faster and more powerful. And thanks to two sensational developments, Carlton radial drills are now better than ever:

Programming—for pre-selecting speeds and feeds for an entire drilling program including as many as 20 or 30 operations.

Pre-Selector—for setting speed and feed for the next operation while machine is still under cut.

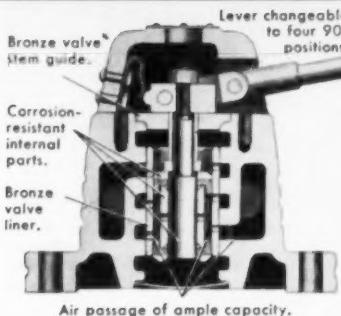
For a revealing radial drill demonstration, ask your Carlton distributor to arrange a showing of the new Carlton programming film. The Carlton Machine Tool Co., Cincinnati 25, Ohio.

For more data circle 353 on Reader Service Card

AIR POWER CAN BE COSTLY!

Eliminate breakdown by choosing Rivett Valves!

LONG LIFE ASSURED BY SIMPLE, COMPACT DESIGN



— at new low prices!

Flexibility for designing any circuit



Be confident of continuous, uniform control by using Rivett Air Valves. Design assures easy operation, long life—precludes need of adjustment—prevents leakage. Easily disassembled for servicing or modification. 5 sizes: $\frac{1}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{3}{4}$ " and 1".

Get this important booklet!



Working drawings, specifications, cut-away views—in 12 fact-filled pages. Write for free copy today!

RIVETT LATHE & GRINDER, Inc.
Dept. MMV3, Brighton 35, Boston, Mass.

REPRESENTATIVES IN ALL PRINCIPAL CITIES

RIVETT

furnishes a complete power package

AIR AND HYDRAULIC — VALVES, CYLINDERS, POWER UNITS

See Rivett Valves, Booth 324, A.S.T.E. Show.

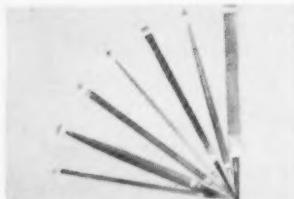
For more data circle 354 on Reader Service Card

PRECISION FILES FOR PRECISION WORK...

THE STORY OF

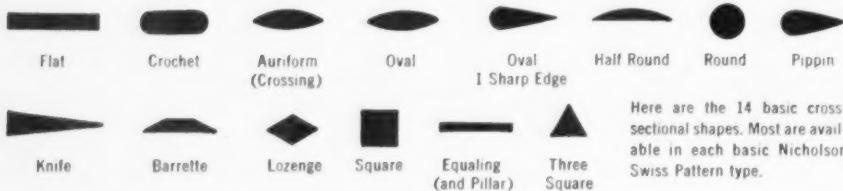


NICHOLSON X.F. SWISS PATTERN FILES



There are hundreds of types and sizes in the Nicholson's Swiss Pattern "family." You'll find Nicholson X.F. (EXtra Fine) files especially developed for precision work in your shop.

Nicholson Swiss Pattern files are made to extremely exacting standards. Many have the same general shapes as American Pattern files, but are thinner and more finely shaped. They come in a greater variety of shapes and sizes, and in six degrees of fineness, instead of the three found in American Pattern files.



Here are the 14 basic cross-sectional shapes. Most are available in each basic Nicholson Swiss Pattern type.

Your Industrial Salesman will gladly tell you more about how Nicholson Swiss Patterns can increase filing efficiency in your shop.



NICHOLSON FILE COMPANY, PROVIDENCE, R.I.

(In Canada: Nicholson File Company of Canada Ltd., Port Hope, Ontario)



NICHOLSON FILES A FILE FOR EVERY PURPOSE

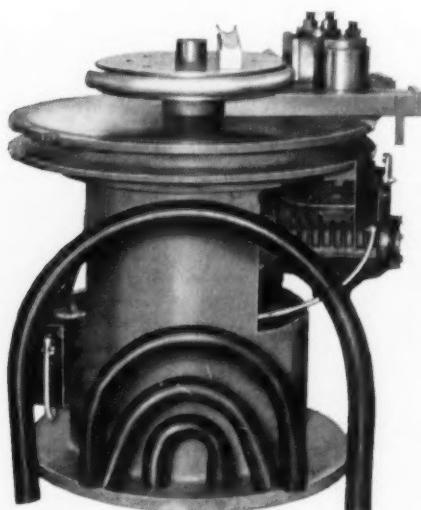
For more data circle 355 on Reader Service Card

it figures!

PEDRICK BENDING COSTS LESS

If it's pipe, tube, or a structural shape—it can be bent faster, cheaper and more accurately on Pedrick Production Benders.

Let us show you *how "it figures"* with a dollars and cents answer to your particular bending problem. Write PEDRICK TOOL AND MACHINE Co., 3640 N. Lawrence St., Philadelphia 40, Pa. Dept. 5.



FREE "PEDRICK LINE" BULLETIN.
WRITE TODAY.

SEE PEDRICK BENDERS AT THE
"TOOL SHOW" — BOOTH 356.

PEDRICK

production benders

For more data circle 356 on Reader Service Card

Announcing



MICROGAGES
.000008" ACCURACY



81-BLOCK SET
\$250.00

30%

*more wear surface
than rectangular blocks*

Two really new and important facts should be noted in this announcement by Van Keuren: the closer tolerance of $\pm .000008"$ on VK Microgages, and the 81-block combination of $\frac{1}{8}$ " diameter longer-wear gages . . . now available for the first time.

These fine quality precision gage blocks by Van Keuren are products of the same machine-lapping and inspection techniques as Van Keuren Rectangular and Solid Square gage blocks. Size tolerance as already noted is guaranteed, as well as a maximum surface roughness of 1.4 RMS. Because their round

shape provides greater wear surface, Van Keuren Microgages can be depended on for longer life and lower cost. Their closer tolerance has been particularly developed to meet today's demands for more exacting precision in shop work.

In addition to the new 81-block closer tolerance set featured here, Van Keuren offers 15 other standard sets of Microgages; also Solid Square type sets of gage blocks in .000004" accuracy and Rectangular type sets in .000004" and .000008" accuracy.

"Quality in Millionths"

Send for a copy of the new, 258-page Van Keuren Catalog and Handbook No. 36 containing valuable technical and engineering information on measuring problems and methods. Address:



THE *Van Keuren* CO.

175 WALTHAM STREET, WATERTOWN, MASS.

Optical Flats . . . Light Wave Equipment . . . Light Wave Micrometers . . .
Gage Blocks . . . Wire Type, Taperlock and Trileck Plug Gages . . . Master
Setting Disk . . . Thread Measuring Wires . . . Gear Measuring Wires . . . Carbide
Plug Gages . . . Laps and Surface Plates . . . Precision Lapping Service.



For more data circle 357 on Reader Service Card

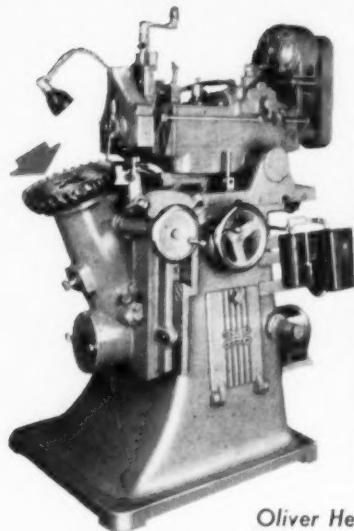
Extremely Accurate . . .

Fully Automatic . . .

Hydraulically Operated . . .

THE

Oliver
FACE MILL GRINDER



- EXCLUSIVE! THE ONLY MACHINE THAT AUTOMATICALLY GRINDS THE FACE, CORNER RADIUS OR CORNER ANGLE, LEAD ANGLE, AND ALL NECESSARY CLEARANCES SIMULTANEOUSLY.
- EXTREME ACCURACY . . . CLOSE TOLERANCES ARE HELD THROUGH AUTOMATIC FIXED LINE GRINDING.
- TOOL ROOM HOURS SAVED . . . GRINDS CUTTERS 6 TO 8 TIMES FASTER.
- THREE STANDARD MACHINES—CAPACITIES: 6" TO 16" DIAMETERS . . . 8" TO 18" DIAMETERS . . . 10" TO 21" DIAMETERS.

Oliver Heavy-Duty Hand Operated Face Mill Grinder for close pitch cutters and Oliver Arc Radius Cutter Grinders are also supplied. Write for complete details.

Oliver INSTRUMENT •
• COMPANY

1430 EAST MAUMEE



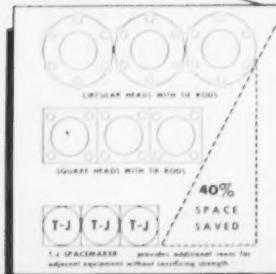
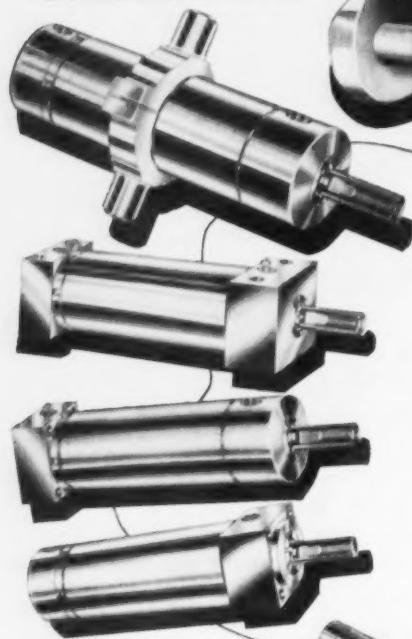
ADRIAN, MICHIGAN

FACE MILL GRINDERS • AUTOMATIC DRILL GRINDERS • DIE MAKING MACHINES
TOOL & CUTTER GRINDERS • DRILL POINT THINNERS • TEMPLATE TOOL GRINDERS

For more data circle 358 on Reader Service Card

**DELIVERY
OFF THE SHELF**

**IN 64,000
COMBINATIONS**



T-J SPACEMAKER provides additional room for adjacent equipment without sacrificing strength.



T-J

Spacemaker

CYLINDERS

**OUTMODE ALL OTHERS
... SAVE 40% SPACE!**

You'll never go back to tie-rod cylinders, once you apply T-J Spacemakers to your push-pull-lift jobs! Advantages in space saved, weight saved, greater strength and off-the-shelf delivery are among the dozens of Extras you get as Standard!

Now — these sensationally popular T-J Spacemaker Cylinders are available off the shelf in sizes up to 8". This means as many as 64,000 different combinations of styles, bores, strokes, mountings, etc. immediately available! Oil pressure to 750—Air to 200 P.S.I. Super Cushion Flexible Seals for Air . . . New Self-Aligning Master Oil Cushion. Hard chrome plated bodies and piston rods (Standard). Only from T-J can you get these new ingenious cushion designs! Send for bulletin SM-155-2. The Tomkins-Johnson Co., Jackson, Mich.

See us in
Fluid Power Area
ASTE Show
Booth 225

Member of the
National Fluid Power Association

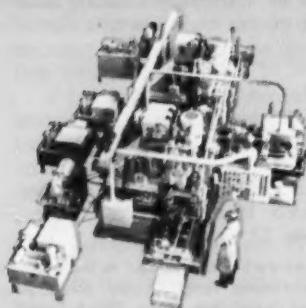
T-J

TOMKINS-JOHNSON

DIVISIONS: AIR AND HYDRAULIC CYLINDERS, CUTTING TOOLS

For more data circle 343 on Reader Service Card

Here's Automatic Production On High-precision Parts



*Multiple-spindle drilling, boring,
facing and tapping machines
Special machines for automatic production*

When is fast transfer production limited by precision requirements? This frontier is steadily being pushed back by Natco engineers in new Holeway processing machines.

Take this throttle body, for example. The large holes are reamed to *limits of .0015" for location, .0003" for size, 125 microinch finish!* Production — 600 parts per hour!

Natco's high-speed gun-drilling heads give required finish in interrupted throttle-shaft holes without reaming. Size is held to within .001".

Many unusual problems are solved in locating, holding and positively controlling light-weight parts between stations at high transfer speed. Chip disposal is automatic; cutting oil is filtered for re-use.

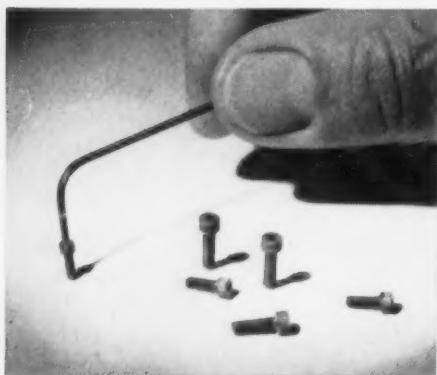
Here's the sequence of operations. Combination rough and semi-finish ream four large holes. Gun drill two holes (two breakthroughs each). Finish ream four large holes.

Whenever fast, automatic production makes sense, don't let high-precision requirements stop you. A Natco engineer can tell you in a hurry whether it's feasible and how the job can be done.

NATCO

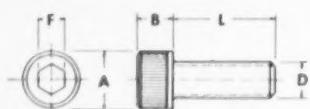
National Automatic Tool Company, Inc. Richmond, Indiana

Miniature screws aid standardization of small devices



Standard UNBRAKO miniature socket head cap screws are available in sizes # 0, # 1, # 2 and # 3, in heat treated alloy steel or stainless steel, at your authorized industrial distributor's. Standard lengths range from $\frac{1}{8}$ to $\frac{1}{2}$ in.

HEAT-TREATED ALLOY STEEL Class 3 Fit Standard



| Diameter | Threads per Inch NC NF | Length | Recommended Installation Torque in Inch-Pounds | | Weight per 1000 in Pounds |
|----------|---------------------------|--------|---|-----|------------------------------|
| | | | NC | NF | |
| #0 | A .104 | 80 | .75 | 2.0 | .152 |
| | B .060 | 80 | 3/16 | 2.0 | .182 |
| | D .060 | 80 | 1/4 | 2.0 | .210 |
| | F .050 | 80 | 5/16 | 2.0 | .265 |
| #1 | A .118 | 72 | 1/8 | 3.5 | .27 |
| | B .073 | 72 | 3/16 | 3.5 | .32 |
| | D .073 | 72 | 1/4 | 3.5 | .37 |
| | F .050 | 72 | 5/16 | 3.5 | .47 |
| #2 | A .140 | 56 | 3/16 | 6.0 | .42 |
| | B .086 | 56 | 1/4 | 6.0 | .50 |
| | D .086 | 56 | 5/16 | 6.0 | .58 |
| | F 1/16 | 56 | 1/2 | 6.0 | .70 |
| #3 | A .161 | 48 | 3/16 | 8.5 | .59 |
| | B .099 | 48 | 1/4 | 8.5 | .70 |
| | D .099 | 48 | 5/16 | 8.5 | .81 |
| | F 5/64 | 48 | 1/2 | 8.5 | 1.03 |

For more data circle 361 on Reader Service Card

Tiny close-tolerance Unbrako screws available in standard sizes

New economies in the design of space-saving small equipment are now possible with these UNBRAKO miniature socket head cap screws. Manufactured to time-piece precision, available locally, they save the costly necessity of designing special screws to fasten tiny parts in compact units. They're ideal for use in typewriters, calculators and computers, servomechanisms, electric and electronic equipment—and in countless other small intricate devices where maximum reduction in bulk and weight is required with no sacrifice in strength of individual components or assemblies.

Fingers grip the knurled heads on these tiny screws positively for easy handling and fast assembly. Uniform hex sockets assure maximum wrenching torque. Controlled fillets under the heads prevent shearing of the heads. Threads are fully formed for maximum strength and exact fit. Extremely accurate head diameters permit their use in countersunk holes, saving weight by reducing the length of the screw required and making flush designs possible.

These standard UNBRAKO miniature screws are available at your authorized industrial distributor's. See him today. Or write us for Bulletin 2055 and samples. STANDARD PRESSED STEEL CO., Jenkintown 22, Pa.

Standard screws are threaded to the head. Special materials, lengths, and threaded lengths are available. One "High-Titan" UNBRAKO hex key is included with each package of 100 screws.

UNBRAKO ®
SOCKET SCREW DIVISION
STANDARD PRESSED STEEL CO.

SPS
JENKINTOWN PENNSYLVANIA

5 REASONS WHY

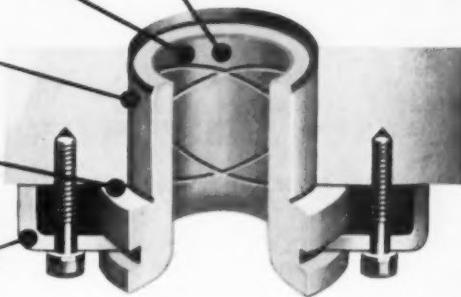
Lamina

GUIDE PIN BUSHINGS

INCREASE
Die Life . . .

REDUCE
Stamping Costs

- 1 Factory-Finished,
precision honed I. D.
- 2 Non-Scoring
bronze electroplated on
hardened steel.*
- 3 Wrink-Fit in
the die shoe—
distortion-free assembly.
- 4 Ground bushing shoulder
seats on the
finished die shoe surface.
- 5 Securely clamped
with special designed
retainers.



Lamina guide pin bushings provide you with permanent, precision-finished inside diameters, full-length bearing surfaces and free, smooth running action. This is your assurance of precision alignment, longer die life, more accurate operation . . . high quality stamped parts, lower maintenance and production costs.

Complete data on these famous Lamina Products is clearly shown in our new Guide Pin and Bushing catalog. Contact us or see your die set manufacturer for your free copy.

*PATENT PENDING

See All LAMINA Products
Booth 562 • ASTE Exposition

Lamina
DIES AND TOOLS, INC.
P.O. BOX 31, ROYAL OAK, MICHIGAN

For more data circle 362 on Reader Service Card

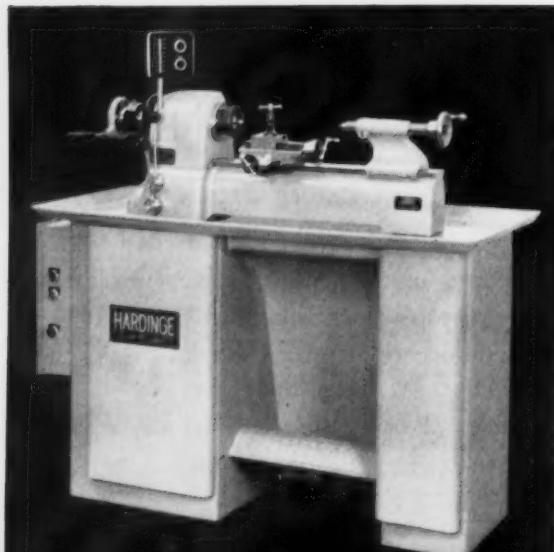
HARDINGE
ELMIRA, N.Y.

NEW Lathe with Variable Speed
for
Tool Room—Development—Production Work



**Simply Push a Button
for
Exact Spindle Speeds**

It's the NEW Simplified Design
EASY AND CONVENIENT TO OPERATE



FEATURING:

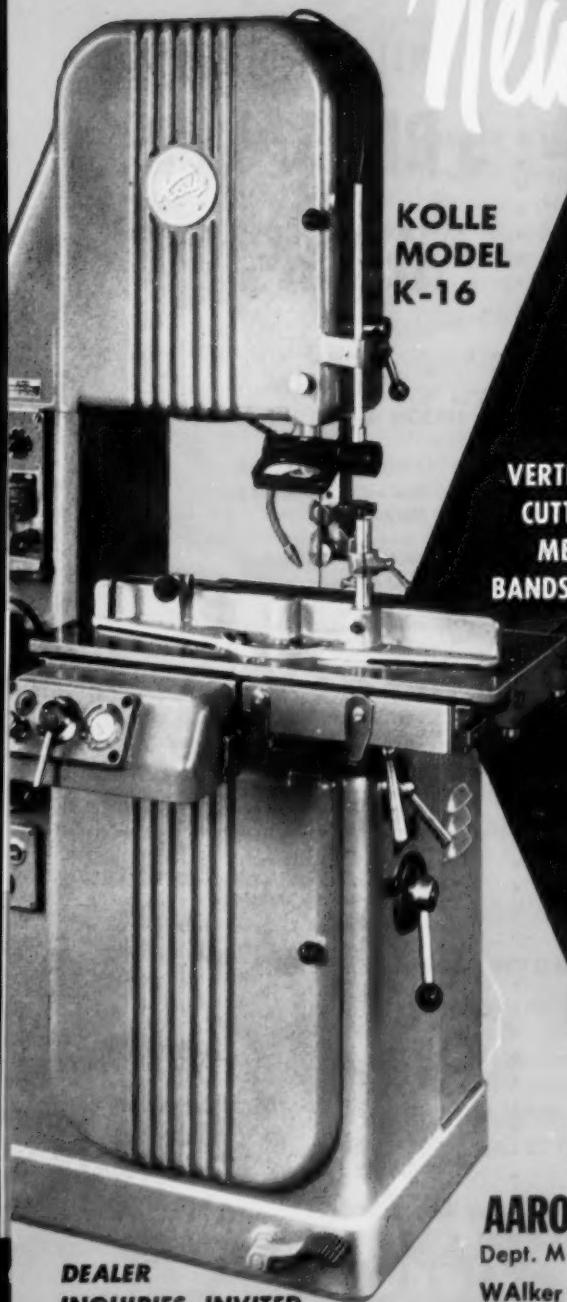
- Infinitely Variable Speeds 230 to 3500 r.p.m.
- Fast Lever Operated Collet with $1\frac{1}{8}$ " Capacity
- Hardened and Ground Steel Dovetail Bed Ways
- Patented Positive Lock Slide Rest
- Full Bearing Tailstock
- And Other Cost Cutting Features

*For Complete Information
on this Precision Lathe
Write for Bulletin
DV59*

HARDINGE BROTHERS, INC., ELMIRA, N.Y.

See HARDINGE MACHINES IN ACTION — Space 452 — Chicago — A.S.T.E. Show
For more data circle 363 on Reader Service Card

SEE US AT THE ASTE INDUSTRIAL EXPOSITION • MARCH 19 - 23
CHICAGO INTERNATIONAL AMPHITHEATRE
BOOTH No. 1907



KOLLE
MODEL
K-16

VERTICAL
CUTTING
METAL
BANDSAW

CONTOUR CUTTING MACHINE

with infinitely variable cutting speeds from 33 to 2378 ft. per minute . . . for sawing, filing, polishing. featuring a table that swivels 15 degrees on ALL FOUR SIDES.

- Hydraulic attachment available for infinitely variable feeds
- All welded steel construction
- Illuminated magnifier
- Butt welder complete with grinding wheel and blade shear
- Circle cutting attachment available

Specifications:

| | |
|------------------------|----------------------|
| Diameter of saw wheels | 15 $\frac{3}{4}$ " |
| Throat depth | 15" |
| Work Thickness | 10" |
| Size of table | 22" x 24" |
| Motor | 1 $\frac{1}{2}$ H.P. |
| Height | 71" |
| Width | 40" |
| Floor space | 23" x 28" |
| NET WEIGHT (Approx.) | 1,540 lbs. |

Best Value at **1695.00**

AARON MACHINERY CO., INC.

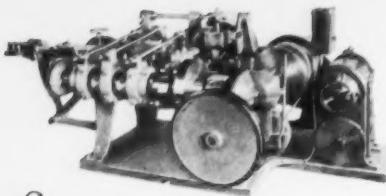
Dept. M • 45 Crosby St., New York 12, N. Y.

WALKER 5-8300

Branches at: Buffalo, N.Y. - Mineola, N.Y.

EXCLUSIVE DISTRIBUTORS IN THE UNITED STATES AND CANADA

DEALER
INQUIRIES INVITED

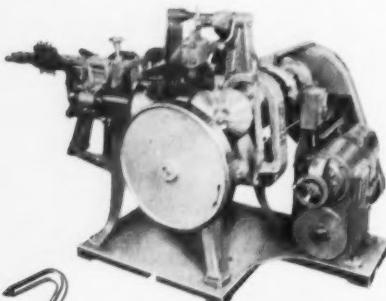


**COMBINATION PRESS AND
FOUR-SLIDE FORMING MACHINES**

Available in 4 Models.

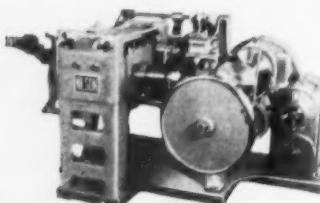
Features: Built-In Crank Press

Feed capacities: 6, 10, and 15 inches.
Press capacities: 8, 12, 20, and 30 tons.
Max. width of stock: 1½, 2, and 2½ inches.
Stroke of press: ¾, ½, 1, and 1½ inches.
Net weight: 2560 to 9700 lbs.



FOUR-SLIDE WIRE FORMING MACHINES

Built-In 10 Models Rated By Wire Capacity Will Form Ribbon Metal Also
Wire diameters formed: approx. 1/64 through ½ inch
Feed lengths available: from 3 to 32 inches
Net weights: from 900 to 18,500 lbs.



**HEAVY DUTY COMBINATION
FOUR-SLIDE MACHINES**

Available in 2 Models.
Features: Built-In Toggle Press

Press capacities: 50 and 75 tons.
Max. feed lengths: 11½ and 16 inches.
Max. width of stock: 2 and 2½ inches.
Stroke of press slides: 2 and 2½ inches.
Net weight: 9535 to 12,700 lbs.



Automatic Chain Making Machines • Staple Forming Machines • Wire and Stock Reels • Wire Straightening Equipment • Slide Feeds for Presses • Wire and Ribbon Stock Forming Machines

For more data circle 365 on Reader Service Card

NILSON OFFERS 5 BIG SAVINGS

IN FORMING WIRE OR RIBBON STOCK

NILSON 4 - SLIDES FEATURE —

1 AUTOMATIC OPERATION

From coil to final formed part.

One man can operate 3 or 4 machines.

2 INCREASED PRODUCTION

50 to 400 pieces per minute depending on size.

3 NO SECONDARY HANDLING

Straightening, cutting off, stamping and forming all in one operation.

4 IMPROVED PRODUCTS

Closer control and precision in stamping and forming parts assures uniformity.

5 LOWEST INITIAL COST

Choice of 16 models for efficiency and economy.

Nilson engineers are always available for consultation on forming problems. Bulletin #61 sent on request.

Nilson's 3 tilt reels and 3 stationary models handle wire or ribbon stock coils up to 500 lbs.



A.H. NILSON
MACHINE COMPANY

1514 RAILROAD AVENUE, BRIDGEPORT 5, CONN.

There Is a HANNA[®] CYLINDER and VALVE for Every Fluid Power Job

HANNA FLUID POWER CYLINDERS (T 750 Series)



For Air operation up to 250 psi and Hydraulic operation up to 750 psi. Standard mountings for every application. The Hanna Fluid Power series have the latest construction and operating features.



WRITE FOR CATALOG No. 750A



HANNA HP HYDRAULIC CYLINDERS

Selected for years by industry around the world, for their smooth, rugged, dependable performance. Operating pressure up to 1500 psi. Sizes and mounting styles for most every need.



WRITE FOR CATALOG No. 233B



HANNA LP AIR & HYDRAULIC CYLINDERS

For low pressure operation up to 250 psi. Standard mountings and a broad capacity range will handle most all low pressure fluid power problems.



WRITE FOR CATALOG No. 236B



HANNA AIR & HYDRAULIC VALVES

Designed to provide most efficient control for Hanna cylinders—ideal for other fine control jobs too. Types available for hand, foot and electric operation, speed control, and automatic and remote control.



WRITE FOR CATALOG No. 254

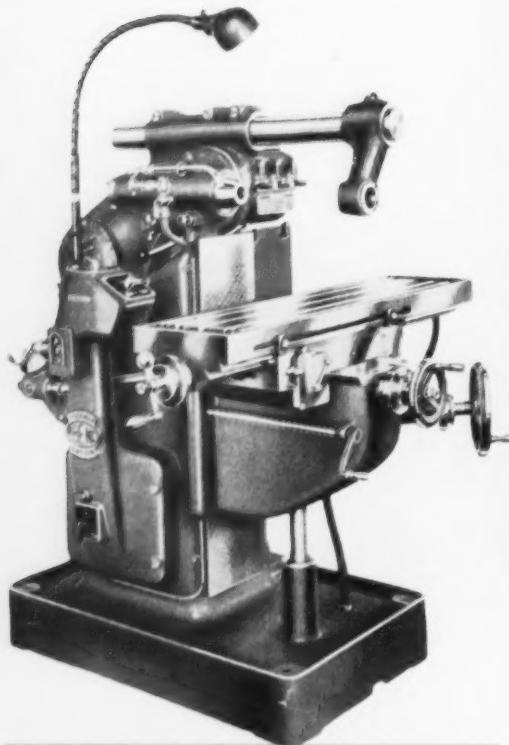


HANNA ENGINEERING WORKS

1758 Elston Avenue, Chicago 22, Illinois

See us at the ASTE Industrial Exposition • March 19 - 23
Chicago International Amphitheatre • Booth No. 1907

combination...



SPECIFICATIONS:

| | |
|--|----------------------|
| Table size (table has 3 T-slots)..... | 10 1/4" x 40" |
| Max. Longitudinal Travel of | |
| Table (Power)..... | 22" |
| Max. Transverse Feed (hand)..... | 8" |
| Distance from Center of | |
| Spindle Nose to Table..... | 20" |
| 12 Spindle Speeds..... | .50 to 1300 rpm |
| 12 Longitudinal Feeds..... | 1/4" to 15" per min. |
| Motor..... | 2 H.P. |
| Extension in Vertical Machine..... | 8" |
| Standard Taper (others can be furnished)..... | No. 40 N.S.T. |
| Gross Weight (approx.)..... | 2,755 lbs. |

VERTICAL HORIZONTAL MILLING MACHINE

ABENE MODEL VHF-2B

**ROLLER BEARING
SPINDLE
STABLE IN ANY
POSITION
RAPID CHANGE-
OVER from vertical
to horizontal posi-
tion or vice-versa
(in 45 to 60 seconds)**

The ABENE VHF-2B combines the working scope of vertical and horizontal millers. Greater distance from spindle to table achieved through sliding head on inclined ram.

Mill horizontally, vertically and at any angle to 90°.

AARON

MACHINERY CO., INC.

Dept. M

45 Crosby Street
New York 12, N. Y.
WALKER 5-8300

For more data circle 367 on Reader Service Card

DOES IT TAKE MORE THAN 8,000 HOURS TO TRAIN A TOOL & DIE MAKER?

And could any thing or any service ever get produced without his higher skills?

So he's a production personage; he rates the right steel in the right size at the right time—fine tool steel completely made-ready for his layout bench.

Consider, then, the advantages of **Warplis** . . .

The steel—oil hardening, non-warping, electric furnace tool steel of this well-known, perfectly balanced composition:

C. .90 Mn. 1.10 Cr. 50 Tung. 50 Va. 15
unparalleled for ease of working, for safe hardening without appreciable warpage or dimensional change, for fine performance

The preparation—all sections, flats, squares and rounds, are ground—precision ground by improved techniques—and dimensionally true, with smooth, flawless, decarb-free surface

The scope—651 standard sizes of flats and squares in 18" lengths, 180 standard sizes of rounds in 36" lengths

The producer—Pittsburgh Tool Steel Wire Co., Monaca, Pa., leading specialists in cold finished fine steels for 54 years.

Procedures may be simplified . . . guess-work removed . . . confusion avoided . . . quality controlled . . . time and money saved . . . by standardizing on this one single grade—at no premium price—for finer tools and dies, and for precision parts, too.

The name to remember is **Warplis** . . . Warplis Ground Flat Stock (flats up to 2" thick and 14" wide, squares up to 4") and Warplis Drill Rods (rounds up to 2"). Available from selected distributors coast-to-coast, or write "Pittsburgh" for descriptive size and price folders.

PITTSBURGH TOOL STEEL WIRE CO. • MONACA, PA.

Since 1908 . . . makers of cold finished fine steels in all sizes, grades and shapes

For more data circle 368 on Reader Service Card



Expensive parts machined to close tolerances are always in danger of being scratched by jagged chips hiding in the weave of ordinary wiping material. Such parts have to be reworked...or scrapped entirely.

This wiping job could cost \$50



Easy to distribute...
always a clean one handy



They really soak up oil...
good for solvents, too



When thoroughly used...
toss 'em in the trash



When you use Scott Wipers, chips don't come back to scar men and metal . . . there's always a clean new wiper handy. You use one thoroughly and throw it away. No more collection, sorting, laundering, distribution.

... this one cost less than ½¢

The difference is . . . Scott Wipers

Strong, highly absorbent Scott Wipers are reducing wiping costs everywhere. Yet they cost so little you can throw them away after a single use when the job calls for a clean wiper free of chips and abrasive material.

This is sanitary wiping. No danger of cuts from hidden chips . . . no fear of skin infection from dirty wipers.

Your Scott man is ready to demon-

strate any time you say. Call today or mail this coupon.



Scott Paper Co., Dept. M
Chester, Pa.
Send information on Scott Wipers.

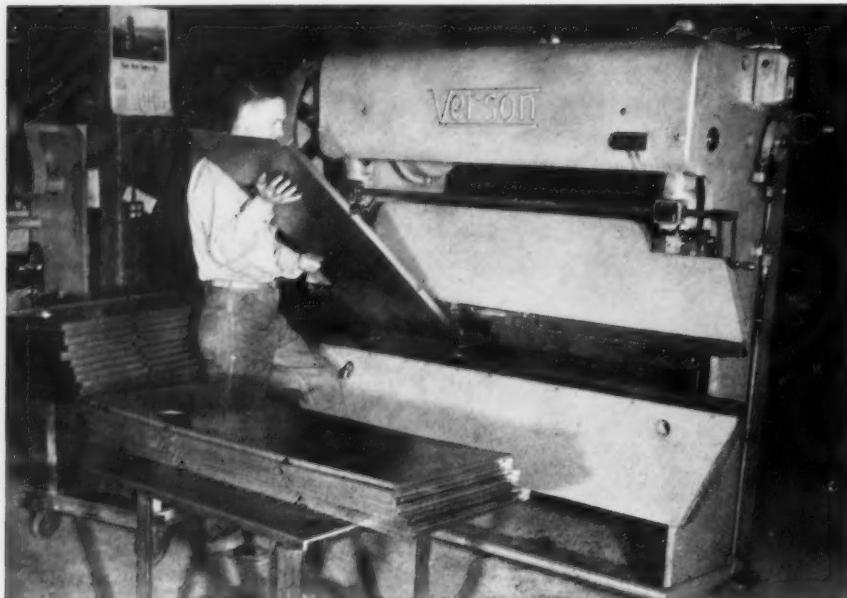
Name _____

Company _____

Position _____

Address _____

\$2,190* PUTS A BRAKE LIKE THIS TO WORK IN YOUR PLANT

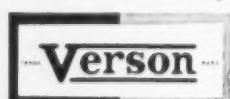


BIG
16 ga. x 78"
CAPACITY
(25 TONS)
AVAILABLE
FROM STOCK

A Verson Press for every job from 60 tons up.

Now you can buy a full power press brake as easily as buying a new automobile. Just pick out the standard model you want, send an order and your brake will be shipped from stock. Two models to choose from — the 16-48 has a capacity of 16 ga. x 48" and is priced at \$1,455.00*; the 1062, shown above, has a capacity of 16 ga. x 78" and is priced at \$2,190.00*. Write for specs.

*F.O.B. Chicago



ORIGINATORS AND PIONEERS OF ALLSTEEL STAMPING PRESS CONSTRUCTION
VERSON ALLSTEEL PRESS CO.

9310 S. Kenwood Avenue, Chicago 19, Illinois
So. Lamar at Ledbetter Drive, Dallas, Texas

MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES
TOOLING • DIE CUSHIONS • VERSON-WHEELON HYDRAULIC PRESSES

For more data circle 371 on Reader Service Card



Electrical Discharge Machining

saved \$448
sinking this
forging die
using BRASS electrodes

Conventional Method

| | |
|--------------------------------------|-----------|
| Mill Cavity (Man and Machine) | 56 hours |
| Hand Finish (Experienced die sinker) | 52 hours |
| TOTAL | 108 hours |

ELOX method

| | |
|--|----------|
| Forge Electrode (Man and machine) | 2 hours |
| Set up and change electrodes (man and machine) | 8 hours |
| Machine hours only (no operator required) | 32 hours |
| Hand finish after E.D.M. | 2 hours |
| TOTAL | 44 hours |

Saved: 64 hours at \$7 per hour

additional EDM advantages in forge die machining:

- Dies are fully heat treated prior to machining thus eliminating possible distortion.
- Resizing forging dies after washout can be done within two hours.
- Inherent workhardening values are retained in the dies since no additional re-heat treating is necessary.
- Actual die life is increased.
- Many forge die alloys are self-polishing after EDM.

This machining application is one of many time and material saving jobs being turned out by the standard Elox M-500 Electronic Machine Tool. See EDM in operation at Elox Demonstration Centers.

elex
corporation of michigan

1839 Stevenson Hwy.
Royal Oak 3, Mich.

Elox Electron Drills for removing broken taps, drills, etc., from \$495 to \$3450.

DEMONSTRATION CENTERS

Plant—Royal Oak, Mich.
45 Broad Ave., Palisades Park, N.J.
1907 W. Monterey, Chicago, Ill.

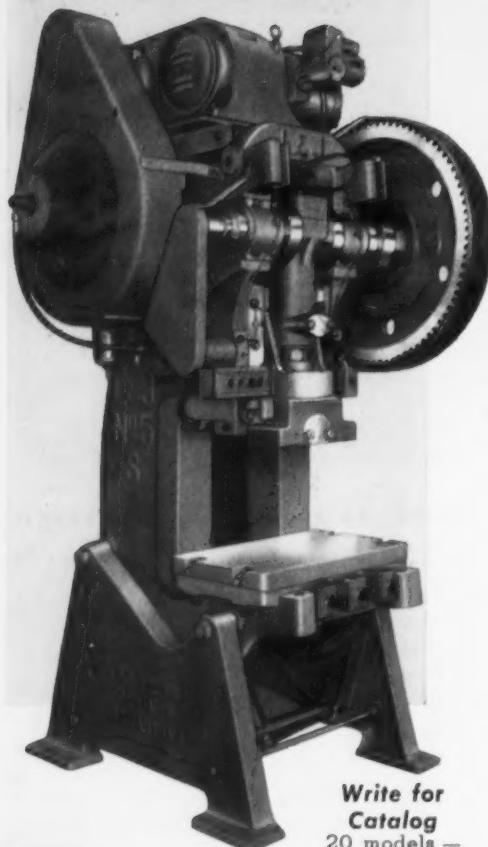
For more data circle 372 on Reader Service Card

March, 1956

modern machine shop 69

New L&J No.5 PRESS

Keeps Production Efficient



Write for
Catalog
20 models —
14 to 90 tons



L&J Press Corporation

1624 Sterling Ave.
Elkhart, Indiana

For more data circle 373 on Reader Service Card

A completely new 56-ton O.B.I. punch press with the quality, accuracy and versatility to keep production costs down. It combines in a widely adaptable size the proven features that have made L&J Presses popular in all types of press shops.

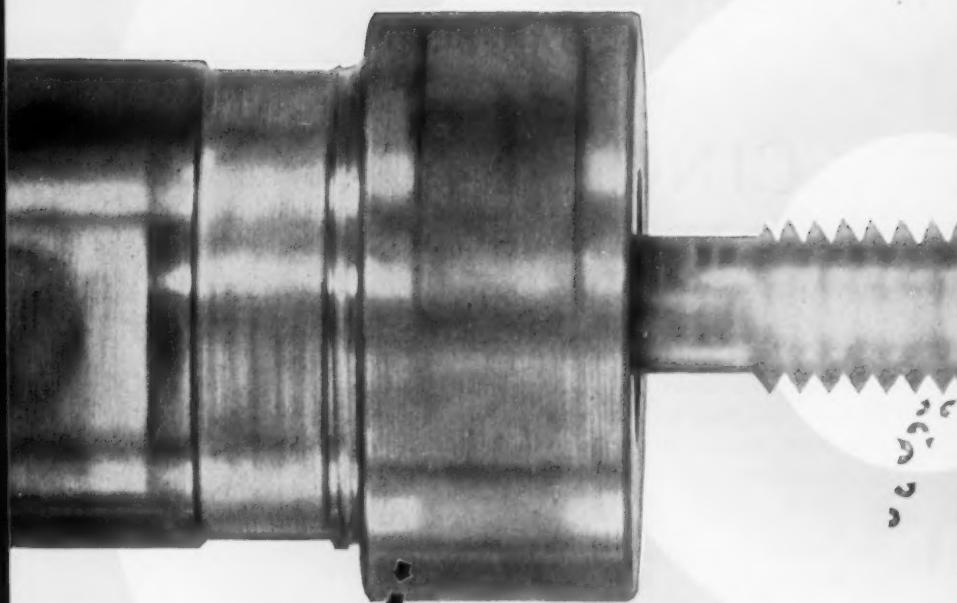
Exceptional rigidity gives longer die life and precision products. Its ruggedness makes routine work of tough jobs while maintenance is held to a minimum.

This is the press you need for better work at lower costs.

Air clutch on back shaft, variable speed drive and flanged ram optional at extra cost. Non-gearred type also available.

Specifications

Capacity—56 tons. Standard stroke—4". Maximum stroke (to order)—6". Strokes per minute—46 (non-gearred 95). Die space—11 $\frac{1}{4}$ " to 18 $\frac{1}{4}$ ". stroke down, adj. up.



Tops for Taps...
it's a
Jacobs
CHUCK

Jacobs and your industrial supply distributor are ready to deliver the chucks you need and the service you deserve. First in chucks... first in service.

THE JACOBS MANUFACTURING COMPANY • WEST HARTFORD, CONN.



The Jacobs Model 91 Spindle Nose Collet Chuck for tool room and engine lathes.



The Jacobs Rubber-Flex Tap Chuck for tapping heads and impact tools.



The Jacobs Plain Bearing Chuck for tapping heads and impact tools.



The Jacobs Ball Bearing Super Chuck for heavy duty and precision industrial use.



The Jacobs Model 96 Collet Chuck for grinding machines, millers and jig-borers.



The Jacobs Impact Keyless Chuck especially designed for the aircraft industry.

CINCINNATI RIGID SHAPERS

New—modern—these Rigid Shapers offer faster, more convenient controls, greater accuracy, greater dependability. The New nodular iron ram, trunnion and vise, and wide heavily ribbed column give a new rigidity—increase accuracy in cutting.

The New slot-free ram also eliminates the manual clamping of ram adjustment—a time saving feature.

A speedy, dependable electro-magnetic brake and clutch insure a faster performance.

50 P.S.I. pressure lubrication, exclusive on Cincinnati Shapers, is a real insurance against wear and a guarantee of long trouble-free performance.

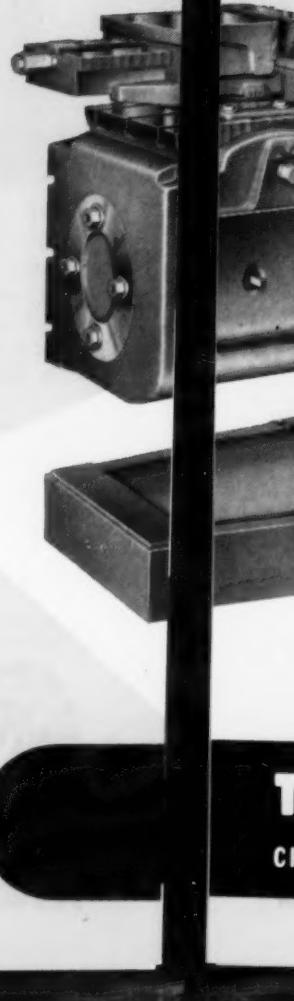
Write for the circular on the New Rigid Shapers.



Modular iron, slot-free
ram

Electro-magnetic Clutch
and Brake

The only shaper with
50 P.S.I. lubrication





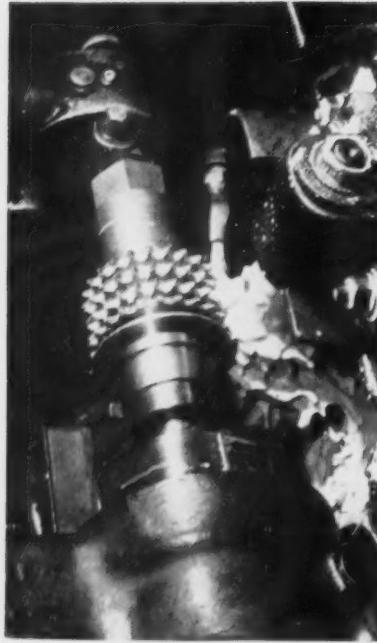
Cincinnati Shapers, Shears and Press
Brakes carry a 5 year guarantee on work-
manship and material—write for details.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A.

SHAPERS • SHEARS • BRAKES

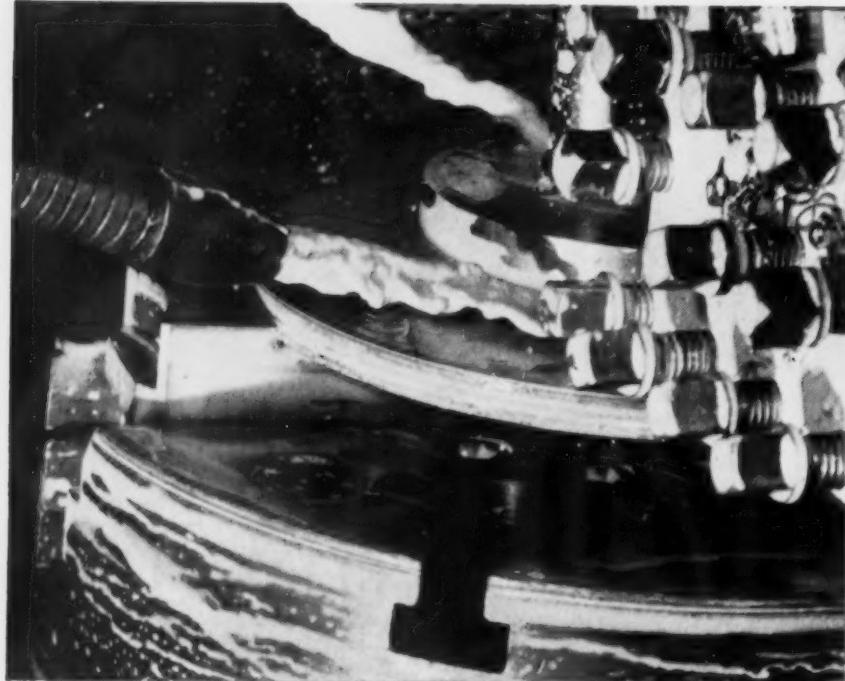




HOBBING. Flooding the cutting edges of a high speed-steel hob working 1117 steel, S.E.C.O. provides lubricity and cooling power needed for long tool life.



CENTERLESS GRINDING. In grinding 4320 H steel pins, S.E.C.O. keeps wheels clean. Grinding dirt drops out quickly, is not recirculated. Parts are rust-protected.



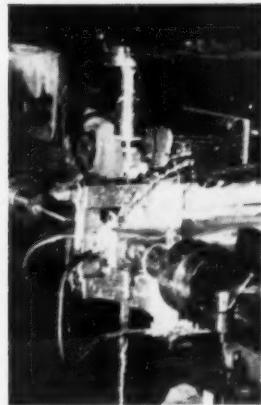
TURNING AND DRILLING. During the machining of a 9-in. piece using carbide-tipped tools, S.E.C.O. removes heat fast ... assures long runs, top speeds.

SUNOCO FUEL SIEVING CUTTING OIL

... assures long runs, top speeds.

quickly, is not reciprocated. It also is true that

SUNOCO EMULSIFYING CUTTING OIL HANDLES 4 TOUGH JOBS . . . EASILY



DRILLING AND REAMING. On steel forgings with a 350-400 Brinell, S.E.C.O. keeps the drills cool... gives clean cutting action.

Whether you are shaping, hobbing, grinding, reaming, boring or milling, it will pay you to look into the advantages of SUNOCO EMULSIFYING CUTTING OIL.

Moderately priced, S.E.C.O. has been industry's most widely used soluble cutting oil for years. Higher-than-ever machining efficiency, increased detergency, easier mixing, and other added advantages are helping keep S.E.C.O. the leading emulsifying cutting oil in the country today.

For complete information about S.E.C.O. see your Sun representative. Address SUN OIL COMPANY, Philadelphia 3, Pa., Dept. MM-3.

INDUSTRIAL PRODUCTS DEPARTMENT
SUN OIL COMPANY

PHILADELPHIA 3, PA.

IN CANADA: SUN OIL COMPANY, LIMITED, TORONTO AND MONTREAL

For more data circle 378 on Reader Service Card





At Wendel Research & Mfg. Corp.

**Shell Dromus Oil E increases tool life 60%,
provides better cooling and
increased production**

This Albertson, New York plant suffered very short tool life, broken bits, chip welding, and tool burning while drilling A.I.S.I. 4140 steel for aircraft parts.

A change to Shell Dromus Oil E cooled off the job at once. Breakage, discoloration and burning were eliminated; chip settling was greatly

improved. *Tool life increased 60%!* Shell Dromus Oil E has excellent wetting and cooling properties . . . wets very rapidly. It provides much longer tool life and fine work finish. Forms a solution, not an emulsion, is stable in any mix; is not sticky or greasy. Just mix in hot, cold, hard or soft water! Write for information.

SHELL OIL COMPANY

50 WEST 30TH STREET, NEW YORK 20, NEW YORK
100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA



For more data circle 379 on Reader Service Card

How to take the guesswork out of contour-grinding

Moore Panto-Crush Wheel Dressers Step Up Latch Output 30% for I-T-E, Assure Interchangeability of Parts.



Five principal I-T-E circuit breaker parts finish ground with Moore Panto-Crush Wheel Dresser. Surface areas between arrows are ground. A comparison of pieces per hour between new method and old method follows:

| Part | Moore Panto-Crush | Old Method | Saving |
|------|-------------------|------------|--------|
| A | 22 | 15 | 33% |
| B | 32 | 22 | 31% |
| C | 31 | 18 | 42% |
| D | 14 | 12.5 | 10% |
| E | 25 | 17 | 32% |



Contour grinding of latch level—Part "E" at left. Here two surfaces and two radii, including inside fillet, are being ground simultaneously.

I-T-E's experience with Panto-Crush Wheel Dressers was fully reported in "American Machinist." We'll gladly send you a reprint and our catalog.

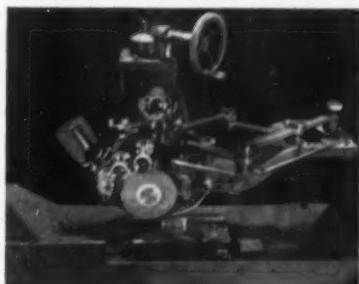
They've taken the "by-guess-and-by-gosh" out of the contour-grinding of toggle latches at I-T-E Circuit Breaker Company, Philadelphia, switchgear manufacturers. Moore Panto-Crush Wheel Dressers have solved the problem of accurate, interchangeable production of these moving mechanical parts so essential to faultless circuit breaker operation.

Irregular contours are now ground by wheels diamond-dressed to exact dimensions within .0002". Before installing Moores, I-T-E ground the contours by shifting the parts at different angles. Accuracy and field interchangeability suffered. Today both are completely satisfactory, and output itself is up 30%!

The Panto-Crush is mounted on the wheel spindle of a surface grinder. It is the only wheel dresser combining a precision-built pantograph for guiding the diamond from a template and a self-driven crush

former. You switch from one to the other without removing workpiece.

MOORE SPECIAL TOOL COMPANY, INC.
730 UNION AVENUE, BRIDGEPORT 7, CONN.



Moore Panto-Crush Wheel Dresser

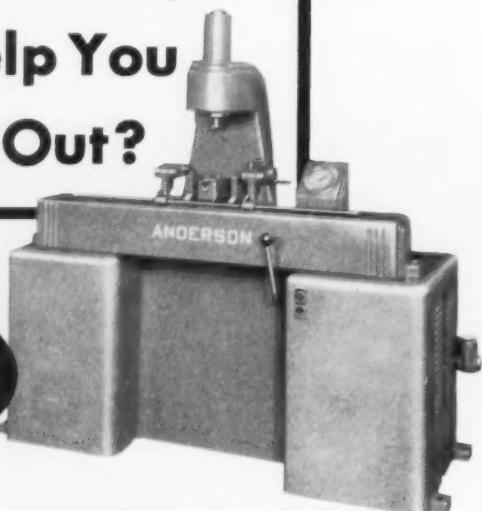
See an important new MOORE machine at ASTE Booth 1430

ADD MOORE TO YOUR TOOLROOM

JIG BORERS • JIG GRINDERS • PANTO-CRUSH WHEEL DRESSERS • DIE FLIPPERS • COMPLETE LINE OF HOLE LOCATION ACCESSORIES

For more data circle 380 on Reader Service Card

Is There Anything We Can Help You Straighten Out?



CHECKS AND BENDS IN THE SAME POSITION

Manufacturers with straightening, checking, and truing operations that require more than ordinary speed and accuracy have found Anderson Power Presses to be the answer to their problems. Here are the results they report:

"Straightened 30 pieces per hour with former equipment. With Anderson Press, 120 per hour. Production increase 400%."

"Anderson Power Press with its complete attachments is definitely more flexible for all types of straightening operations. It is faster, more accurate, and pressure is easily controlled. It is simple to operate."

"Formerly had a tolerance on drawing of plus or minus .002". After installing Anderson Press changed drawings to plus or minus 1/2 thousandth."

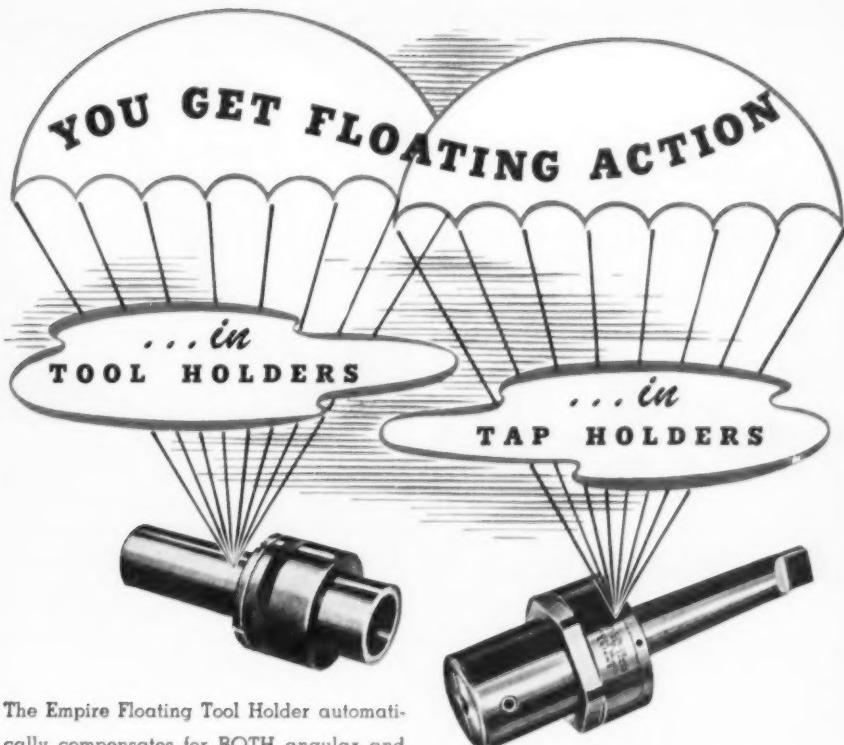
These actual reports from users prove that with an Anderson Power Press you get it straight — fast. Profit from low-cost high production, precision straightening.

Write for Bulletin 3-22.



ANDERSON BROS. MFG. CO.
ROCKFORD, ILLINOIS

For more data circle 381 on Reader Service Card



The Empire Floating Tool Holder automatically compensates for BOTH angular and parallel misalignment. Sleeve and shank float independently of each other...achieving a free and easy movement...exclusive with Empire. Amount of float is infinitely adjustable. Minimum maintenance—holder has only five parts. Moving parts ride on rollers for smoother running with perfect alignment...and anti-friction of members. Bell mouths and over-sized holes eliminated, allowing for extremely close tolerance work.

Taps float IN and OUT with the Empire Floating Tap Holder. Designed to prevent freezing under tension caused by drag on the tap. Automatically corrects parallel and angular misalignment. Simple adjustment of locknut provides accurate control of wide range of float. Flotation makes close tolerances easy to hold. No spring or pivot members to restrict float. Available with straight or tapered shanks.

EMPIRE TOOL COMPANY

8776 GRINNELL AVE. • DETROIT 13, MICHIGAN

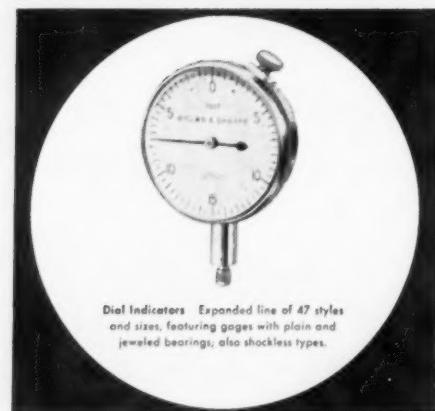
For more data circle 382 on Reader Service Card

not 1
 not 2
 but 9
 new aids
 to
 precision!

BUY THROUGH YOUR LOCAL DISTRIBUTOR



Black Granite Surface Plates and Accessories
 Surface plates, parallels, angle plates,
 and straight edges. Highest wear
 resistance and extreme precision.



Dial Indicators Expanded line of 47 styles
 and sizes, featuring gages with plain and
 jeweled bearings; also shockless types.

Here they are! Nine new additions to the progressive Brown & Sharpe Line . . . nine advanced tools that make your precision production more efficient and economical. See them at the show. Then write for full details on these and other tools in this diversified line. Brown & Sharpe Mfg. Co., Providence 1, Rhode Island.

Space No. 374, A.S.T.E. Show, Chicago

Brown & Sharpe 



Tri-Cal Universal Vernier Caliper A tool of
 three-fold ability! Takes outside, inside,
 or depth measurements directly to thousandths
 of an inch. Fully hardened, stainless steel.

For more data circle 383 on Reader Service Card



Super Vernier Height Gages Provide full use of scale to zero. Dull chrome finish. Long, super-vernier plate. Highest wear resistance.



Two-Size End Mills Different diameter at each end of shank. Two-lipped and four-lipped. Half as many mills required for range of sizes.



Bench Centers Economical, small size for work to 18" length.



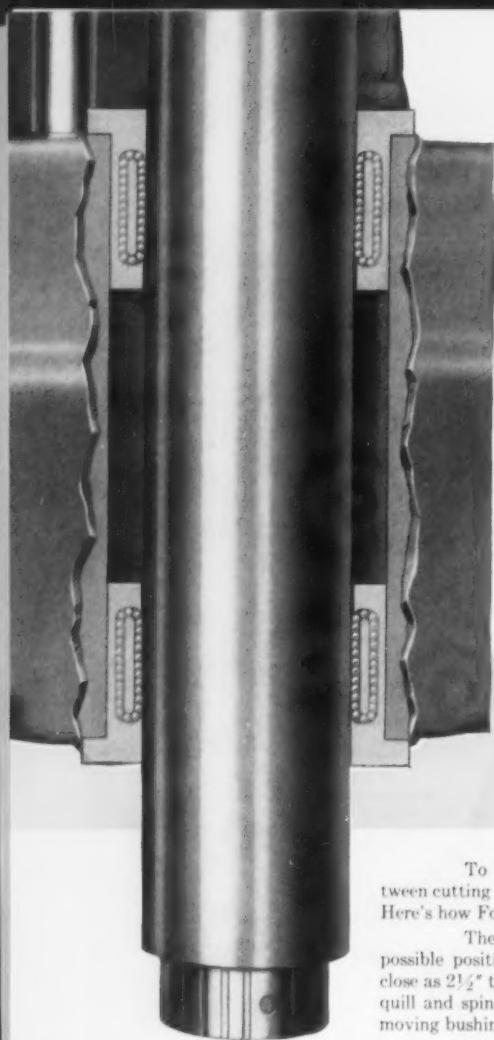
Permanent Magnet Chucks Two lighter, lower, rectangular models (5" x 10" and 6" x 18"). Provide greater magnetic surface and increased holding power. Advanced design back rails.



Hite-Check For use with dial indicators. Inexpensive tool for accurate transfer of precise measurements.



Hite-Set Speeds vertical precision measurements. Reads directly in 0.0001ths.



**NEW QUILL
BEARING DESIGN**
helps achieve
extreme precision in
Fosmatic Jig Borer

To bore with precision as close as $\pm .0001"$, distance between cutting tool and lower quill bearing must be held to a minimum. Here's how Fosdick minimizes this crucial distance.

The lower quill bearing is *permanently* located at the lowest possible position in the head, permits boring with spindle nose as close as $2\frac{1}{2}"$ to the bearing. Bearing does not ride up and down with quill and spindle as in conventional designs where balls are held in moving bushings.

The permanent location of quill bearings is made possible by unique Fosdick design—vertical ball races with preloaded precision balls circulating continuously. This design also permits spindle and quill to be shorter; thus stronger and more rigid. Both are perfect cylinders with no cuts on the outside.

Engineering advancements like this make the Fosmatic Jig Borer the most rigid and precise boring machine you can buy. Write today for the new catalog.

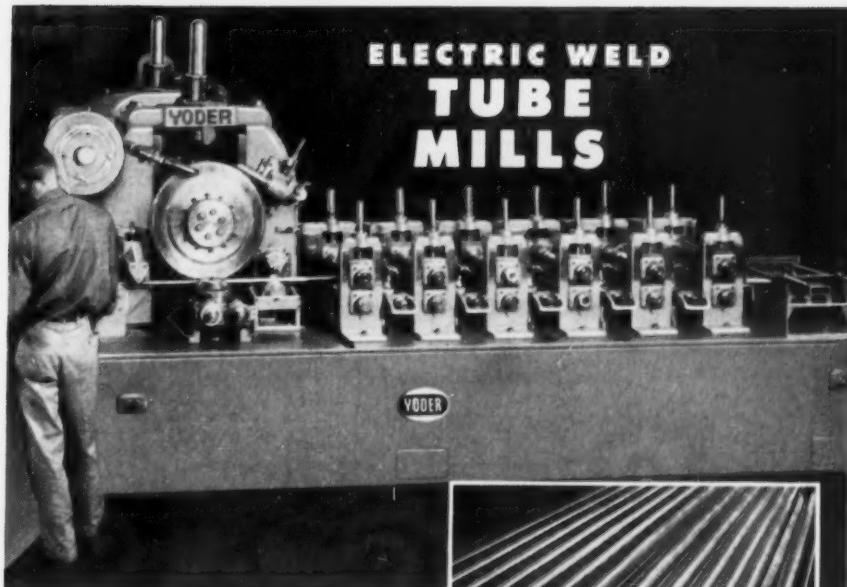
Eight models available from the low-cost Model 30 with $36" \times 18"$ table, to the virtually automatic model 54P with $54" \times 22"$ table. Other important features: Automatic Positioning, choice of two precision measuring systems, milling feed, rapid traverse to quill, power clamping of table and spindle, coolant system and reversing motor control for tapping.

NEED JIG BORING EQUIPMENT? GET A PROPOSAL FROM FOSDICK!

Fosmatic Radial Drills Jig Borers Sensitive and Upright Drills Sensitive Radial Drills Jig Grinders Automatic Positioning Jig Borers

FOSDICK

FOSDICK MACHINE TOOL CO., CINCINNATI 23, OHIO



ELECTRIC WELD TUBE MILLS

The photo shows the tube forming mill and welder of a complete Yoder mill recently installed for an Italian customer. Although it looks very much like a standard Yoder mill, it embodies special mechanical and electrical innovations designed for *tube production at speeds up to 350 fpm*—from 200 to 300% faster than heretofore considered practical by the resistance-weld process. This is just one example of the many new things introduced by Yoder in pipe and tube making equipment, to meet widely varying production needs. Other recent Yoder developments are induction weld mills for making steel as well as non-ferrous pipe and tubing, at speeds never before approached by this process, and adding greatly to its recognized economic advantages. For more complete information about the latest technological advances in Yoder tube mill equipment, write, wire or phone

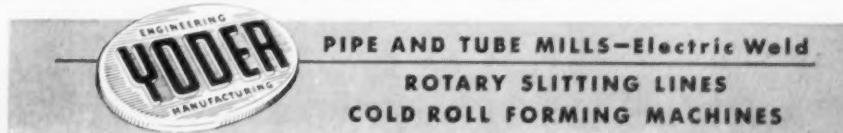
THE YODER COMPANY

5532 Walworth Ave., Cleveland 2, Ohio



Literature on Request:

- 1. Electric Weld Tube Mills for *Steel Tubes* up to 4" diameter.
- 2. Induction Weld Tube Mills—sizes up to 8" diameter for aluminum, nickel, copper, brass, inconel, monel, stainless and other alloys.
- 3. Pipe Mills—electric weld—for sizes up to 24" diameter.



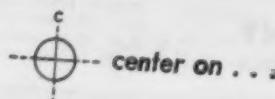
For more data circle 386 on Reader Service Card

"LATHEDOG" USES THE TAPER TURNING ATTACHMENT

WHAT IS
LATHEDOG
DOIN' WITH
ALL THEM
PENCILS?

HE'S USIN' THE TAPER
TURNING ATTACHMENT
ON THE NEW
CINCINNATI
TRAY TOP TO
SHARPEN THEM
FOR THE NEW
WAITRESS
IN THE
CAFETERIA!

BOY! WHAT PRECISION!
TURNS THE POINTS
DOWN TO $\pm .00001$
WITHOUT BREAKIN'
A SINGLE LEAD!



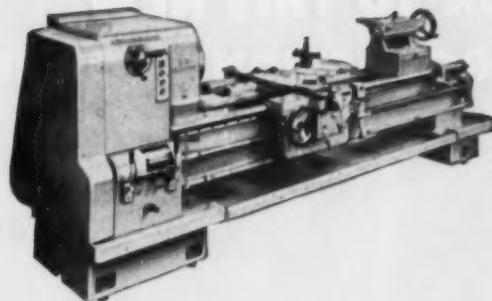
cincinnati

J.R.WILLIAMS

THAT NEW
WAITRESS
AIN'T GONNA
THANK
LATHE DOG
FOR GETTING
CUTTING
OIL ALL
OVER HER
PENCILS!



Copr. 1955 by NEA Service, Inc.
Large size prints of this
J. R. Williams cartoon are
available for framing.



Lots of folks who know about Cincinnati Tray-Tops don't know that every size has a full set of accessories available. And even more folks don't know that the famous Tray-Top line has been expanded to include a 21½" and a 26" size. Tray-Tops are the low-priced lathes with the high-priced features:

1. All geared headstock
2. 12 spindle speeds in geometric progression
3. Direct-reading, speed-shifting mechanism
4. Large spindle mounted in three antifriction bearings
5. Flame hardened gears in headstock, quick-change box and apron
6. Cabinet legs on the 10", 12½", 15" and 18" sizes
7. Enclosed quick-change box with lead screw reverse
8. One shot lubrication of the ways
9. Ground ways (flame hardened at extra cost)
10. Tray-Tops on headstock and tailstock
11. One piece, double-walled apron with automatic lubrication
12. Fully enclosed electrical panel, built-in disconnect, transformer, motor and controls (all standard equipment)
13. Complete operating and service manuals
14. Built-in leveling jacks

We also make a complete line of floor, bench and radial drilling machines.

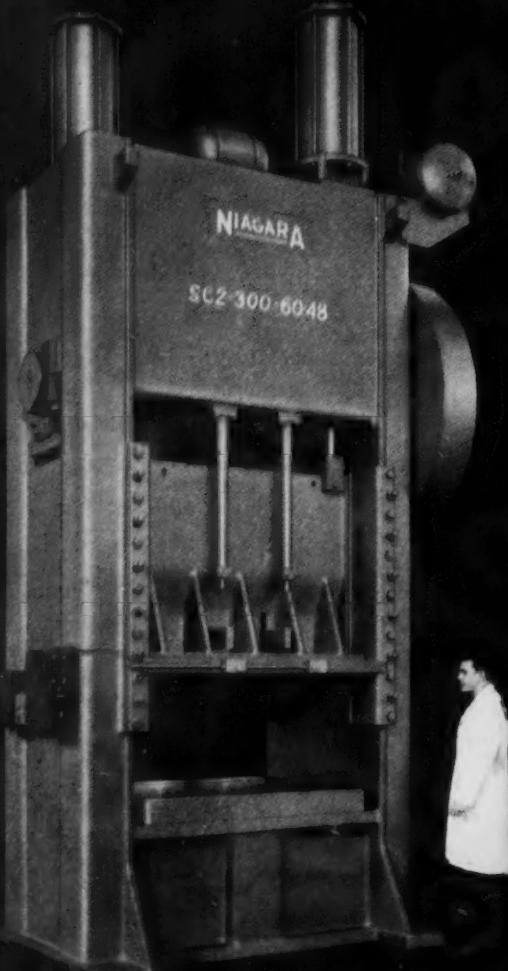
For complete catalogs, prices and the name of your local dealer, write on company letterhead to Cincinnati Lathe & Tool Co., 3261 Disney, Cincinnati 9, Ohio.

lathes and drills



For more data circle 388 on Reader Service Card

LOOK TO THIS NEW, PRODUCTION-BOOSTING LINE



50 THROUGH 300-TON CAPACITIES



America's Most Complete Line of Presses, Shears, Machines and Tools for Plate and Sheet Metal Work

DES
DRI
Full
and
The
clut
reas
thro
sari

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SHI
Box
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con
heig
die
vide
five-
effic
jogg

RUG
PRO
All-s
exclu
impr
diagr
and

GREA
ADJU
Unus
slide
fram
range

N

For a realistic answer to the metal stamping and forming problems of today... and tomorrow

DESIGN MODERNIZATION CONCEALS DRIVING MECHANISM

Fully streamlined, enclosed construction, front and back, provides pronounced advantages. There are no exposed, overhanging flywheel, clutch, brake, intermediate shaft, nor motor in rear of press to obstruct crane service, block light, throw grease and consume floor space unnecessarily... yet all parts are quickly accessible.

WORK-SAVING FLEXIBILITY MEETS SHIFTING PRODUCTION NEEDS

Box type welded steel slides are power adjusted through self-locking, worm driven, barrel type connections to accommodate a wide range of die heights and to permit quicker, easier and safer die setting. Niagara electric clutch control provides trouble-free push button operation and a five-position selector switch for ease, safety and efficiency in single stroking, continuous running, jogging, reverse jogging and slide adjustment.

RUGGED, HEAVY DUTY FRAMES PROLONG DIE LIFE

All-steel, rigidly constructed frames, featuring an exclusive triple box section design, provide maximum resistance to deflection from horizontal, diagonal and torsional stresses. Greater accuracy and longer die life are thereby assured.

GREAT SHUT HEIGHT AND LONG SLIDE ADJUSTMENT

Unusually liberal shut height and extremely long slide adjustment, of both one and four-piece frame construction, permit use of a tremendous range of stamping and forming dies.

Hailed as the most progressive step in straight side, double crank press history, the new Niagara SC-2 Press Series could only have originated from a keen insight of today's metal working problems and the more challenging ones of tomorrow. In every detail of design, you'll recognize the unduplicated competence of Niagara engineers. Who else would be more mindful of press users' needs than the men who design and build America's leading and most complete line of presses, press brakes, shears, other machines and tools for plate and sheet metal work?



CHECK THE FEATURE-BY-FEATURE EVIDENCE

Preview this complete new line of straight side presses at once. Find out what they can do for you. Write for Niagara's new, illustrated Bulletin 64-H today.

NIAGARA MACHINE & TOOL WORKS
BUFFALO 11, N. Y.

DISTRICT OFFICES:

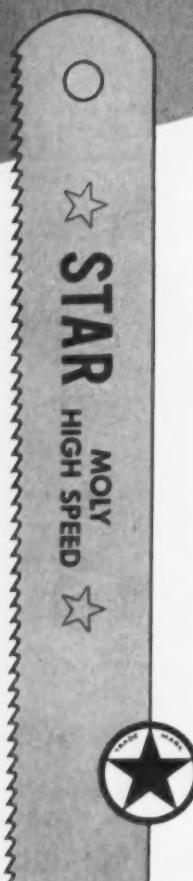
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Dealers in principal U. S. cities and major foreign countries

NIAGARA

**STRAIGHT SIDE
DOUBLE CRANK
PRESSES**



If you have a
head for value



Order any of the full line of STAR Hand and Power Hacksaws, Metal and Wood Cutting Bandsaws and Hacksaw Frames from your Industrial Distributor.

Industry prefers STAR quality, prefers the blades made of carefully heat-treated, top-quality steel, fabricated on specially designed equipment — because STAR consistently delivers fast, economical metal cutting and long blade life.

Be sure to ask your Industrial Distributor for STAR "Moly"® High Speed Steel Blades. STAR developed this high speed, heavily-alloyed steel blade of molybdenum. Remember, "Moly" High Speed blades outlast standard steel blades 10 to 1, cut as well as the best high speed steel blades made, but are substantially lower in cost.

FREE! Ask your Industrial Distributor for a supply
of our NEW Metal Cutting Booklets and Wall Charts

Sold Only
Through
Recognized
Distributors

CLEMSON
CLEMSON BROS., INC.
MIDDLETOWN, N. Y., U. S. A.



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Makers of Hand and Power Hacksaw Blades, Frames, Metal and
Wood Cutting Band Saw Blades and Clemson Lawn Mowers.

For more data circle 391 on Reader Service Card

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BULLARD
 pendant
 control . . .

*is
 sure handy
 for the
 operator!"*

the machine
 is outstanding
 for ease of
 operation



CALL YOUR NEAREST
 BULLARD SALES OFFICE
 OR DISTRIBUTOR
 OR MAIL COUPON TO

Says boring mill operator at Fuller Company, Manheim, Pennsylvania, manufacturers of conveying equipment, coolers, compressors and vacuum pumps. Also, he says, "there are no levers to mess around with. On the Bullard H.B.M., Model 75, I can mill on a 45° angle in any quadrant instead of having to jockey in one direction, then in the other — like I had to do on the old machine."



For full information on all the cost saving advantages offered by the Bullard Horizontal Boring, Milling and Drilling Machine, Model 75, including screw and rack feed, wide speed ranges, extra rigidity in Bed, Head, Head Post and Rear Post, optical measuring equipment (optional) and Automatic Positioning for head and table (optional),

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A HIT!

Users praise Norton TUMBLEX "T" — the new bonded, triangular tumbling abrasive



In Unbeatable Combination For Better Barrel-Finishing. The new Norton Tumblex "T" abrasive brings you these advantages for top performance: non-wedging triangular shape; fast-cutting bonded ALUNDUM* abrasive; and 4 sizes for the widest range of applications.

Reports prove Tumblex "T" abrasive brings many new "TOUCH of GOLD" benefits to barrel-finishing

Here's one of the most revolutionary barrel-finishing innovations ever developed. In typical on-the-job tests, Norton customers report that the new Tumblex "T" tumbling abrasive:

"cuts tumbling cycle time from five hours to one hour."

"finishes steel and magnesium parts that could never before be barrel-finished."

"completely removes burrs from stainless steel parts in four hours. Abrasives previously used failed to do so in 12 hours."

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Its uniform triangular shape and size prevents wedging in recesses of parts.

Made of famous Norton ALUNDUM abrasive, it cuts fast, with no compound needed — resulting in shorter time cycles and lower costs per piece finished.

It provides maximum surface contact with parts being processed, assuring top quality work in fastest time.

It wears down evenly, keeping the same triangular shape. No small chips to lodge in holes, slots, etc. — and when worn down it can be used on parts requiring a smaller size abrasive.

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G-295

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For more data circle 394 on Reader Service Card

OVER THE EDITOR'S DESK . . .



GROWTH AND PROSPERITY

Today, nearly 60 per cent of us are home owners, as against some 40 per cent fifteen years ago. We have over five million two-car families, although our total automobile registration reached five million only 40 years ago. Last year, as a people, we bought more cars, air conditioners, television sets, furniture, and suits of clothes than ever before, and built almost as many houses as in our peak year of 1950. We bought more pianos, more furs, more hi-fi record systems, and more jewelry. And if anyone is clucking his tongue at such extravagance, let him consider also that we saved more than \$16,000,000,000, an imposing total in a year when we also paid nearly \$90,000,000,000 in federal, state and local taxes.

Crawford H. Greenewalt

★ ★ ★

IT AFFECTS ALL OF US

In a detailed study of the farm problem, the Research and Policy Committee of the Committee for Economic Development recommends that the costs of necessary economic readjustments for agriculture be shared by the country as a whole, rather than being borne entirely by

farmers. To deal with the problem of surplus crops, the committee recommends "a combination of continued price supports at gradually reduced levels, coupled with a program to pay farmers to take some land out of production." Government rental of this land, primarily wheat acreage, should be geared to bringing production and consumption into balance over a transitional period of perhaps five years.

To deal with the problem of unstable incomes, the committee recommends "moderating extreme price fluctuations through a system of flexible price supports or income payments and a storage program. These devices would not be used to affect the long-run movement of prices but would protect farmers against sharp and temporary swings of prices and income."

To alleviate the problems of about one million farmers in areas of persistently low incomes, the committee recommends stimulation of "trends already in existence." The movement of people out of farming in the South, where the low income farmers are largely concentrated, has been more rapid than in the rest of agriculture. This movement should be encouraged by increasing the amount of information available

FOUND WHERE WORLD FAMOUS AIRCRAFT ARE "BORN"

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Just take a look in their toolrooms! Every one of these famous aircraft manufacturers uses Grand Rapids Grinders . . . engineered and built for unusual long life of precision grinding. Our Model 55 shown here, for instance, features column and base of massive, one-piece casting for vibrationless rigidity and permanent alignment. Both longitudinal table travel and cross feed are hydraulically actuated. Wheel head has powered rapid vertical travel. Table speed is variable up to 125 fpm . . . faster than any other of this type and size.

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This precision tool room type machine has table speed up to 125 fpm. Working surface of table is 12" x 36". Vertical movement of wheel head 18". Preloaded ball bearing spindle greased for life. Spindle speeds 1925 and 2500 rpm.



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GALLMEYER & LIVINGSTON COMPANY 408 Straight Ave., S.W., Grand Rapids, Michigan



Letters to the Editor:

REPRINT

We have seen your reprint of "New Machine Can Skin, Spar and Profile Mill," July, 1955 issue of Modern Machine Shop. This reprint rings loud and clear to us, since the new A-72-C (both machines built to date) Contour-Profile Milling Machines are installed in our plant here in Wichita.

We are specifically interested in procuring one hundred (100) copies of the above reprint and respectfully request same be sent to undersigned for use at Boeing-Wichita.

Committee for Economic Development

* * *

CONVENTIONS AND CONTACTS

Did you know that nearly 75 thousand conventions are held in the United States annually? Twelve thousand are annual meetings of trade associations. Six million businessmen attend conventions each year—and most of them probably go to trade association conventions. Trade association meetings provide opportunities for businessmen to find out what's new in their industry, to unearth a few new customers, to do a little business and sometimes a lot. Most businessmen attend conventions for about the same reasons young ladies and laddies attend junior proms—to make contacts, to eye the competition, and to avoid the bad public relations that attach to the absentee.

Come in and visit with the folks from Modern Machine Shop, Booth No. 685 in the International Amphitheatre, when you're in Chicago attending the ASTE Convention during the week of March 19.

*W. D. Geist, Chief Equipment Engineer
Equipment Engineering
Boeing Airplane Company
Wichita Division*

EPOXY DIES

We found your article on Epoxy Dies most interesting and would like more information and literature on Epoxy Dies.

We would appreciate it if you would send to us or let us know where we can obtain more data on these Epoxy Dies.

*Alexander DeSantis, General Manager
Virjune Manufacturing Co.
Waterbury, Connecticut*

Will you please let me know where I may obtain some of the epoxy resin which you mention in your article in the January issue?

*C. M. Liddy, Owner
Liddy's Machine Shop
Jacksonville, Florida*

• For information, literature, or resin write direct to Shell Chemical

If you've only seen **MICROBORE**[®] in advertisements
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For more data circle 395 on Reader Service Card

March, 1956

The DeVlieg Microbore exhibit
will include a wide range of
Precision Tooling for general
purpose and production applications

OVER THE EDITOR'S DESK . . .



Corporation, 380 Madison Avenue,
New York 17, New York.—Ed.

MARKING

Do you know of a technique for marking numerals on hardened round drill blanks, Rockwell 60 to 63? Marking must be neat and at least .003 in. deep, legible with drill held horizontally, letter size approximately 1/16 to 1/8 in. tall. Hand electric etching is unsuitable; marking should be wide enough and deep enough to show up well after black oxide dip. Your recommendations of special or standard machinery, devices or techniques will be greatly appreciated.

Sydney Dock
Steptool Grinding and Manufacturing Co.
Los Angeles, California

ELECTRICAL DISCHARGE MACHINING

We are looking for suitable equipment with which to machine hard metals using the method of submerged electro-discharge or vibration. We are also interested in the devices for removing broken taps and drills which would be operated on similar principle.

J. Kossowski
Precision Methods and Machines
Waterbury, Connecticut

• Try Elox Corporation of Michigan,
739 North Rochester Road,
Clawson, Michigan.—Ed.

LAPPING

We would like to obtain as much information on lapping, as possible. Can you send us this information or advise us as to where we may get it?

Donald C. Vavala
Millard F. Davis
Wilmington, Delaware

• List of names of manufacturers sent.—Ed.

PUNCH PRESS MANUFACTURER

Do you have any record of a company known as C. R. & W. A. Nelson Company, said to be in Chicago, Illinois, and who are or were manufacturers of a punch press? One of our members is very anxious to locate this company or its successors. Any information or suggestions you may be able to offer will be very much appreciated.

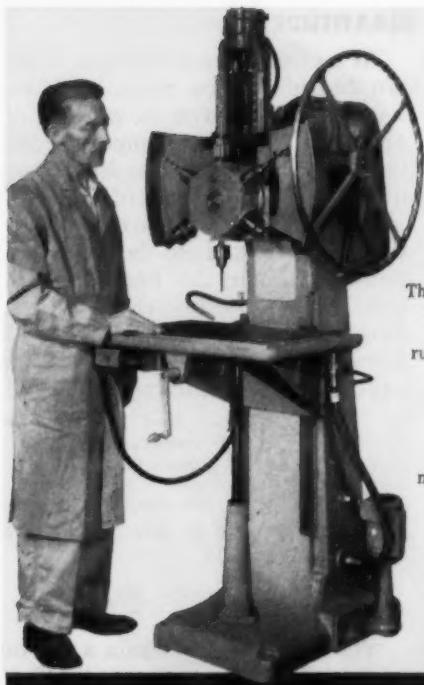
S. Farkas
National Association of Purchasing Agents
New York, New York

• Closest we can come to it is a C. R. Nelson, 3955 North Lamon, Chicago, Illinois.—Ed.

VIALS AND SNAP RINGS

We need information as to who could make special precision bubble vials. We would prefer a company as close to this area of Western Nebraska as possible. We also need a source of supply for some special tapered snap rings, similar to those used in holding ball bearings in position. The snap rings should be of stainless steel and we can furnish prints just as soon as we know to whom to send them.

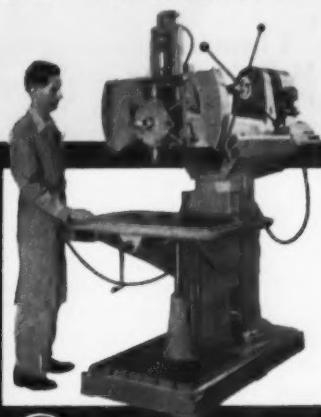
C. Morris Boyle
C. Morris Boyle Blasting Service
Kimball, Nebraska



NEW

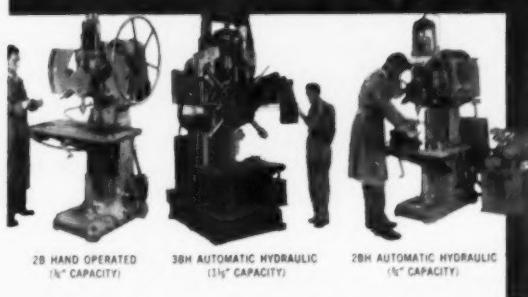
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TURRET DRILL—Model 1C

The Model 1C Turret Drill expands the BURGMASTER line to include a smaller capacity, sensitive feed, fast operating machine. It is built to the same rugged standard for rigidity and accuracy evident in the larger BURGMASTER units. Users will experience such important benefits as fast power indexing; very sensitive hand feed; preselective speeds and stops; time savings and increased accuracy by elimination of quick change tools, or need for moving from one machine to another; easy handling of holes up to $\frac{3}{8}$ " in steel, thus freeing heavy duty machines for larger capacity work.



**The IMPROVED Model 2BR
RAM TYPE RADIAL TURRET DRILL...**

features a new sensitivity in handling, power indexing and power clamping. When the ram is clamped in position, the 2BR can function as a deep throat production turret drill, easily handling holes up to $\frac{3}{8}$ ". This machine greatly increases production on bulky pieces as all tools are mounted on the machine and are quickly indexed into position. The operator simply brings the spindle into position over the work, releases pressure on a button in the handle (located on turret head) and the machine automatically clamps ram and column. He is ready quickly to drill, tap, etc., thereby saving repositioning several times over a particular position.



For complete information, write Dept. MM-3
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See BURGMASTERS in action—Booth 388
ASTE Industrial Exposition, March 19-23
CHICAGO International Amphitheatre.

For more data circle 396 on Reader Service Card



WELDED STEEL TUBING

We would appreciate your sending us copies of the three installments of "How to Fabricate Welded Steel Tubing" by W. E. McFee.

*John Tuit, Production Engineer
McInerney Spring & Wire Co.
Passaic, New Jersey*

Please send me a complete set of articles by W. E. McFee.

*Irvin B. Rose, Special Machine Design Dept.
Acme Aluminum Alloys
Dayton, Ohio*

I have been following Mr. W. E. McFee's articles entitled "How to Fabricate Welded Steel Tubing" with great interest. Can you send me reprints of these articles?

*R. M. Roderick, Chief Engineer
Sheet Metal Specialty Division
Follansbee, West Virginia*

When one of our salesmen was in a customer's office, he noticed the magazine Modern Machine Shop and the issue he was looking through was December, 1955. In this issue there was an article on tube fabricating and the article referred to a previous article in an earlier issue.

Would you kindly let us know where it would be possible to obtain a copy of this magazine in which these articles appeared, as we are very much interested in the subject which was discussed?

*C. V. Hartman, Tube Department Sales
Revere Copper and Brass Incorporated
Rome, New York*

GRATITUDE

As a faithful reader of your Modern Machine Shop magazine, may I congratulate you on the worthwhile articles presented so completely and concisely. You are undoubtedly acquainted with the mass of literature and magazines that pass over a chief engineer's desk these days and can understand why he must consider only the best for his scrutiny. Your magazine is one that I receive with favor and I take this opportunity to express my appreciation.

*John Watt, Chief Engineer
Ampco Products
Compton, California*

• *Our pledge, to do everything possible to continue to merit such generous praise.—Ed.*

CLAMPING

We would like to obtain a reprint of the article "Clamping on the Tangent" by Fred Rogers.

*K. H. Snedden, Materials Technician
Miehle Printing Press and Manufacturing Co.
Chicago, Illinois*

Please send me tear sheets of the article entitled, "Clamping on the Tangent" which was so excellently illustrated in the January issue. This would include pages 106 through 117 of the January issue.

*L. R. May, General Manager
Cast-Master, Inc.
Bedford, Ohio*

Please send to the attention of the writer a copy of your article entitled "Clamping on the Tangent" which appeared in the January 1956 issue.

*William Schulze, Production Engineer
Fischer & Porter Company
Hatboro, Pennsylvania*



**Want to Save Money
in YOUR Tool Room?**

THEN get a handy NORBIDE® Dressing Stick from your local Norton distributor. You'll find it's just the thing for cleaning up a wheel face, forming a radius or touching up a tool wheel in a jiffy!

You'll find too that with one of these light, easy-to-grip sticks you can see more of the wheel face and avoid costly overdressing. And it will greatly reduce dust nuisance too.

Better yet, a NORBIDE Stick of Boron Carbide—the hardest man-made material commercially available—will outlast hundreds of ordinary sticks.

Order one today or write for Form 1567 giving more details.

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NORTON

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Next to the diamond in hardness—
available at a fraction of diamond cost

For more data circle 397 on Reader Service Card



Please send me a reprint or tear sheets of the article "Clamping on the Tangent" that appeared on pages 106-117 of the January 1956 issue.

A. Umit Bursay, Chief Design Engineer
The Ivy Company
Norwalk, Connecticut

PLATING

Please forward us information on the equipment required to install and maintain the Morey Process for chrome plating small tools such as punches, dies, and so on.

E. A. Hall
Bulova Watch Company, Inc.
Sag Harbor, Long Island, New York

● *More information on Morey Process can be obtained from Mr. George Dimirjian, President, Chrome Electro-Forming Company, 7515 Lyndon Avenue, Detroit 21, Michigan.—Ed.*

CONTROL

We are endeavoring to locate the manufacturer of a piece of equipment which we believe is known as the Walker Hydraulic Lathe Control, for use as a tracing attachment on lathes and other machine tools. We have been unable to locate the manufacturer of this unit and wonder if among your extensive files of American manufacturers you may be able to help us.

P. A. Putziger, Sales Manager
Matthew Moody & Sons Ltd.
Montreal, Quebec, Canada

● *Try the Walker Hydraulic Duplicator Company, Box 72, Standish, Michigan.—Ed.*

WHERE TO DINE

When in Chicago at the A.S.T.E. Convention and Industrial Exposition, we recommend:

- Allegretti's Grill**, 359 N. Wells St. (Loop)
Bit of Sweden, 1015 N. Rush St.
Blackhawk Restaurant, 139 N. Wabash (Loop)
Buttery — Ambassador West Hotel, N. State & E. Goethe Sts.
Camellia House — Drake Hotel, E. Lake Shore Dr. & N. Michigan Ave.
Cape Cod Room — Drake Hotel, E. Lake Shore Dr. & N. Michigan Ave.
College Inn Porterhouse — Hotel Sherman, N. Clark & W. Randolph Sts.
Don, The Beachcomber, 101 E. Walton Place
Etel's Field Building Restaurant, 130 S. Clark St.
Charles Harrison Restaurant, 1 N. La-Salle St.
Hoe Sai Gai, 75 W. Randolph St.
House of Eng., 106 E. Walton Pl.
Ireland's, 632 N. Clark St.
Isbell's, 940 N. Rush St.
Ivanhoe, 3000 N. Clark St.
Jacques French Restaurant, 900 N. Michigan Ave.
Kungsholm, 100 E. Ontario (Near Loop)
L'Aiglon, 22 E. Ontario
Mann's Rainbo Restaurant, 73 E. Lake St. (Loop)
Old Heidelberg, 14 W. Randolph St.
Pump Room—Ambassador East Hotel, N. State & E. Goethe Sts.
Ray's Steak House, 112 E. Illinois (Near Loop)
Red Star Inn, 1528 N. Clark St.
Riccardo's Studio Restaurant, 437 N. Rush St.
Shangri-La, 222 N. State St.
Sirloin Room—Stockyards Inn, 4178 Halsted
St. Hubert's Old English Grill, 316 S. Federal St. (Loop)
Sweden House, 157 E. Ohio St.
Swiss Chalet—Bismarck Hotel, 171 Randolph St.
Well of the Sea — Hotel Sherman, N. Clark & Randolph Sts.
Wrigley Building Restaurant, 410 N. Michigan Ave.

ARMSTRONG

SET-UP and HOLD-DOWN TOOLS



PLANER JACKS



NON-SKID JACKS



STEP BLOCK



T-SLOT BOLTS AND NUTS

For more data circle 358 on Reader Service Card



ARMSTRONG Set-up and Hold-down Tools reduce setting-up time—keep men and machines producing. Designed for use on planers, drill presses, milling machines, etc., they hold work securely and rigidly, and thereby reduce spoilage and prevent costly accidents.

Your local Armstrong Distributor carries ARMSTRONG Set-up and Hold-down Tools in stock in sizes for every operation. Stop haphazard setting-up methods. Provide each of your machines with a full complement of ARMSTRONG Set-up and Hold-down Tools.

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T-SLOT CLAMP



STRAP CLAMPS



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STRAP CLAMPS

FEATURES IN T

NEW TOOLING TECHNIQUE FOR GUIDED MISSILE FABRICATION

By Gilbert C. Close

The advantages of butt welding in aircraft and guided missile fabrication are outlined in this interesting article. Illustrations show the various tools and machines used at Airline Welding and Engineering Company, Hawthorne, California, in adapting the technique to the missile production. Page 104.



MARCH
1956

CARBIDE INSERT TOOL PERFORMS TOUGH STEEL CUTTING JOB

By George B. Varner

The job described in this article involves an eccentric cast steel gear, which is rough turned on a large boring mill equipped with a heavy-duty tool, utilizing a carbide insert. Page 110.

FACING AND DEBURRING WELDED PIPE SECTIONS

By C. Norman Kirschner

This article points out how a metal fabricating firm has increased production from 135 to 500 pieces per hour with a "home-made" automatic drill unit setup. Page 112.

SIMPLE OPERATIONS CAN MEAN BIG LOSSES

By Robert J. Flynn

According to the text of this article, the difference between a reasonable profit and a disastrous loss on contracts very often hinges on adherence to the more routine parts of specifications. Page 114.

DRAW FORMER ADAPTED TO INTERNAL BROACHING JOB

By John Innes

The Chance Vought Aircraft Plant in Dallas, Texas, employs a draw forming machine to internally broach 9-foot 61ST6 aluminum tubing. Page 120.

THIS ISSUE

MACHINING STAINLESS STEEL

By G. J. Stevens

This case history points out how difficulties were eliminated in deep-drilling a concentric hole in a stainless steel pin. Page 122.

CARBIDE TOOLS REDUCE GEAR MAKING COSTS

Tool costs were reduced from 9 cents to 2 cents per piece and the production rate was nearly doubled in an eastern gear manufacturing plant through the use of eight brazed-type flat carbide tools and one insert holder, employed in a multiple tool setup on a 20-inch automatic lathe. Page 124.

WAY MACHINE TOOLED FOR REFRIGERATOR PARTS PRODUCTION

A four-station indexing fixture, installed on a standard Ex-Cell-O one-way precision boring machine, enables the machine to accurately bore, counterbore and chamfer two offset opposing cylinders of cast iron compressor crankcases used in the production of refrigerators. Page 130.

ASTE INDUSTRIAL EXPOSITION

"Tooling for Tomorrow" is the theme of the American Society of Tool Engineers' Industrial Exposition, which is to be held in the Chicago International Amphitheatre from March 19th through 23rd. In addition to general information regarding the "Tool Show," this section presents the complete technical program that will be held concurrently with the Exposition, as well as floor plans of the International Amphitheatre and a complete list of exhibitors at the ASTE Industrial Exposition. Moreover, there are illustrations and descriptions of the various tools, machines and materials that will be displayed at the show. Page 134.

VOL. 28

NO. 10



New Tooling Technique for

Advantages of butt welding in aircraft and guided missile fabrication are outlined.

By GILBERT C. CLOSE

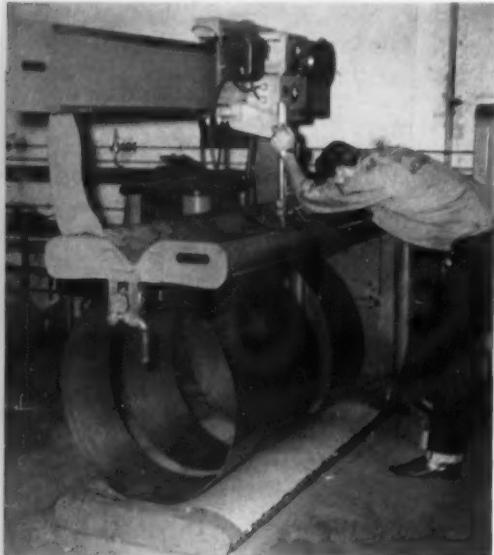
The ancient sage who coined that old phrase, "Necessity is the mother of invention," must have had a premonition of the aircraft and missile industry. Ever since its beginning, production engineers in or associated with the aircraft industry have had to continually modify,

revise and improve old "tried and true" fabrication techniques to meet the demands of design engineers.

The results of these efforts are not confined to the airplants. Many of the improvements accomplished to date are seeping into civilian production work where they are replacing processes and techniques that have been considered "standard" for many years.

One of the latest innovations, originated specifically for aircraft and missile fabrication, is the use of butt welds in building up sheet metal structures. Using automatic sheet metal butt welding machines now available, it is possible to butt weld together sheets of aluminum, titanium, stainless steel, and many more common alloys, ranging downward to 0.010 inch in thickness or upward to 1 inch in thickness. Needless to say, many civilian industries have already adopted this technique, while others are regarding its advantages with an avid eye. This is particularly true of industries producing either sheet metal pressure vessels or sheet metal food and liquid containers.

Byron R. Russell, owner-manager



Butt welding guided missile tubular skin sections on automatic butt welding machine.

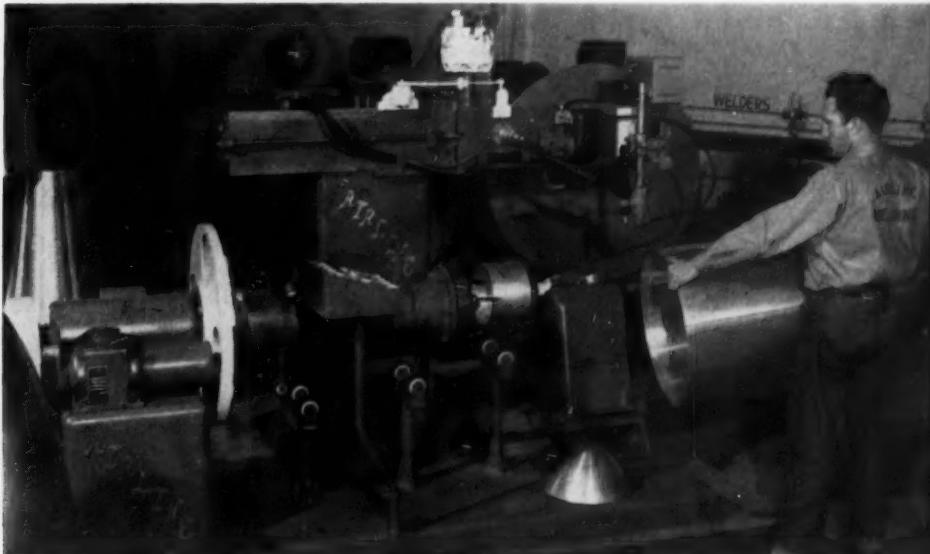
Guided Missile Fabrication

of Airline Welding and Engineering Company, Hawthorne, California, a leader in the design and production of automatic sheet metal butt welding equipment, traces the development of sheet metal butt welding back to fundamental aircraft and missile requirements.

"First, however, we must give due credit to the inert atmosphere technique of welding," Mr. Russell says. "Successful butt welding of thin-gauge sheet metal requires complete visibility for the operator, along with

an intense and concentrated arc, and power sources ranging from 7 to 700 amperes. Oxidation during welding must be held to an absolute minimum. Fortunately, the various inert atmosphere arc welding techniques and equipment provide these particular necessities.

"With these techniques available, the development of our automatic sheet metal butt welding machines centered around the design of means to hold the sheet metal weld components in straight juxtaposition and



Mounting aluminum cone section on expanding holding mandrels of circumferential welder. The cone nose to be welded in place fits in pneumatically actuated "nose pad" holder.

"Precision butt welds . . . are minus any external protuberances whatsoever."

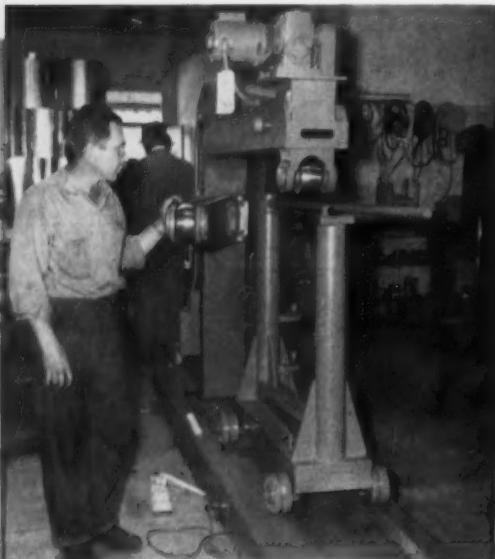
close proximity along the butting edges, and a means of maintaining and controlling arc travel during welding."

Mr. Russell enumerates the advantages of sheet metal butt welding in this way: First, in conjunction with aircraft and missile design, and especially in connection with supersonic air speeds, clean external aerodynamic surfaces are a major consideration. Joined sections of these surfaces must fair into each other with a minimum of external protuberance. Precision butt welds properly made and either planished

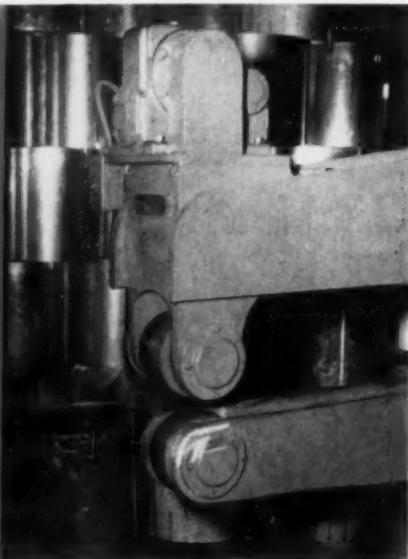
or ground smooth are minus any external protuberances whatsoever.

Secondly, a butt welded joint contains minimum mass as there is no overlap of the parent metals. This results in some weight-saving, a very important consideration in conjunction with all aircraft structures. And while this weight-saving may be measured in ounces per weld seam, the aggregate becomes considerable throughout an airplane or a guided missile.

The same applies to the cost of the materials consumed in fabricating the weld joint, which becomes



General view of seam weld planishing machine. Note interchangeable lower arm with roller, and bucking mandrel mounted on dolly.



Close-up view of planishing machine pressure head. Upper roll is powered and drags weld seam through as planishing progresses.

important in conjunction with the high-cost alloys such as titanium or stainless steel. It is obvious that a butt welded joint requires a minimum of parent metal. Here again, while the cost savings per weld seam may be measured in pennies, the total mounts when all the weld seams used in an airplane or missile are considered.

As welded sheet metal structures are widely used as pressure vessels or liquid containers (drop tanks, napalm bombs, drums, food containers, and so on) testing of the weld seam for soundness and leakproof properties becomes an important production process. When a leak is discovered in a butt welded joint, locating its exact position is a simple matter. The leak will be "straight through," and repair can be limited to the indicated area only.

A final incentive toward the use of fusion butt welding in critical sheet metal structures, according to Mr. Russell, is the fact that the butt welds can be easily planished to improve their physical characteristics, thus making heat treatment of the welded structures unnecessary. "To round out our line, we have designed and are now producing a roll-type planishing machine to accomplish the desired results," Mr. Russell says.

The Airline Welding and Engineering Company planishing machine develops up to 10,000 lb. of roll pressure. This results in tremendous planishing pressure when calculated in p.s.i., as actual contact between the planishing roll and weld seam is limited to a fraction of a square inch. In planishing, the weld

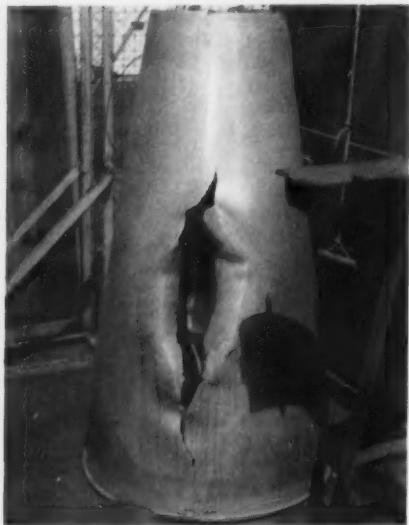


Planishing butt welded water heater body on Airline Welding planishing machine.



Planishing tubular sections, using dolly-mounted backing mandrel. Smaller tubular parts can be planished with this setup.

From 30 to 50 per cent greater weld strength . . .



This aluminum cone section fractured along weld seam when post-weld forming was attempted. Planishing seam solved problem.

seam is merely passed between the pressure rolls. The applied pressure serves to cold work the weld metal, thus reducing its grain size and improving its strength and ductility. Planished weld seams are claimed to exhibit from 30 to 50 per cent greater weld strength (in tension) than unplanned weld seams with many alloys or combinations of alloy and filler rod metal.

Planishing also improves the ductility of the weld metal, making it possible to form many sheet metal structures after they have been butt welded and planished. One of the illustrations included in this article shows a butt welded sheet metal cone

section that ruptured along the weld seam when an attempt was made to form it in the "as welded" condition. After planishing the weld seam, the cone could be easily formed and is now in steady production.

Two types of automatic sheet metal butt welders are being produced at Airline Welding and Engineering Company—one for straight seam butt welding of flat sheets or tubular or conical structures; the other for circumferential welds in tubular or conical structures. In the straight seam welders, a series of pneumatically actuated "fingers" grip the sheet metal weld components along the butting edges and force the edges firmly together and downward against the backing strip. The welding head travels on a track above the table of the machine, with its speed and height controlled by the operator. The welding tables on these machines have an "open end" so that pre-formed tubular or conical structures may be slipped on or demounted from the open end.

On the circumferential welder, the cone section is centered and held by a circular series of expanding segments which act also as the backing strip during welding. These segments expand so slightly that the gap between them remains negligible. The nose section to be welded to the cone is then positioned in a pneumatically actuated "nose pad" which presses it firmly into place and holds it there during welding. Mr. Russell is already toying with

an overhead tracing arrangement on these machines to permit longitudinal welding in formed cone sections.

One of the greatest advantages of these machines (from the fabrication standpoint only) is that they eliminate the necessity of spot-tack welding to obtain alignment of the component parts. The weld components are merely sheared to the correct size prior to welding and then mated and held in position by the automatic butt welder.

Nearly 50 per cent of the sheet

metal structures being produced on a job-lot basis at Airline Welding and Engineering Company (as well as those being produced on machines that have been sold to various customers) are fusion butt welded without the use of a filler metal. This is specifically advantageous when welding corrosion-resistant alloys. Elimination of the filler metal also prevents the possibility of introducing a constituent that would tend to reduce the corrosion-resistant properties of the parent metal.

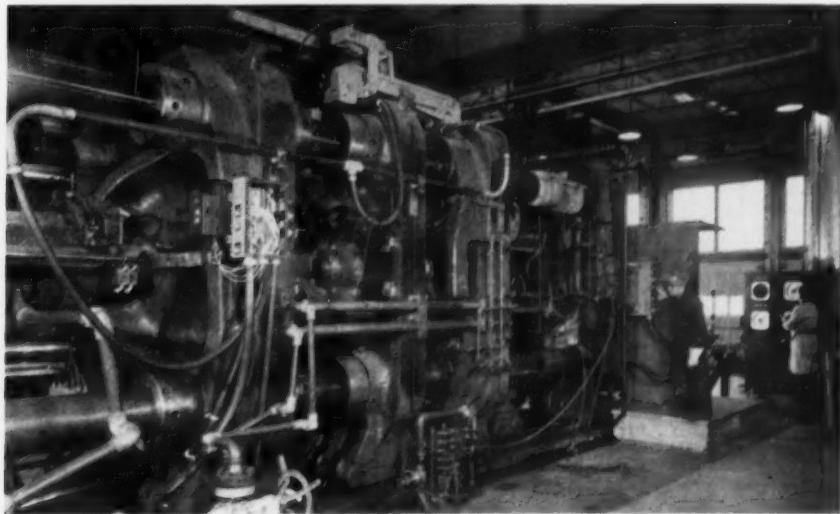


72-Inch Die Casting Machine Produces Engine Blocks

A 72-inch die casting machine, illustrated herewith, is used in producing six-cylinder aluminum automobile engine blocks from an experi-

mental die. This machine, believed to be the world's largest, weighs 250 tons and can handle dies weighing up to 50 tons. The machine was developed at the Toledo, Ohio, plant of the National Lead Company's Doebler-Jarvis Division.

For more data circle 1 on Reader Service Card



72-Inch Die Casting Machine used in producing six-cylinder automobile engine blocks.

Carbide Insert Tool Performs

Tough Steel

An eccentric cast steel gear is rough turned on a large boring mill equipped with a heavy duty tool utilizing a carbide insert.

By GEORGE B. VARNER

A metal removal speed in excess of 93 cubic inches per minute is being obtained on the Cincinnati Hypro boring mill illustrated here-with, which employs a heavy duty Kindex tool with a Grade K21 turn-over insert to rough turn an eccentric cast steel gear. This metalworking task was considered a rugged steel cutting assignment by a leading manufacturer of heavy machine tool equipment.

The 72 x 8½-inch gear has severe sand inclusions and torch-cut casting gates. Such irregularities on the outside diameter made it necessary to remove from 2½ inches to 3½ inches of steel in machining the gear to finish size.

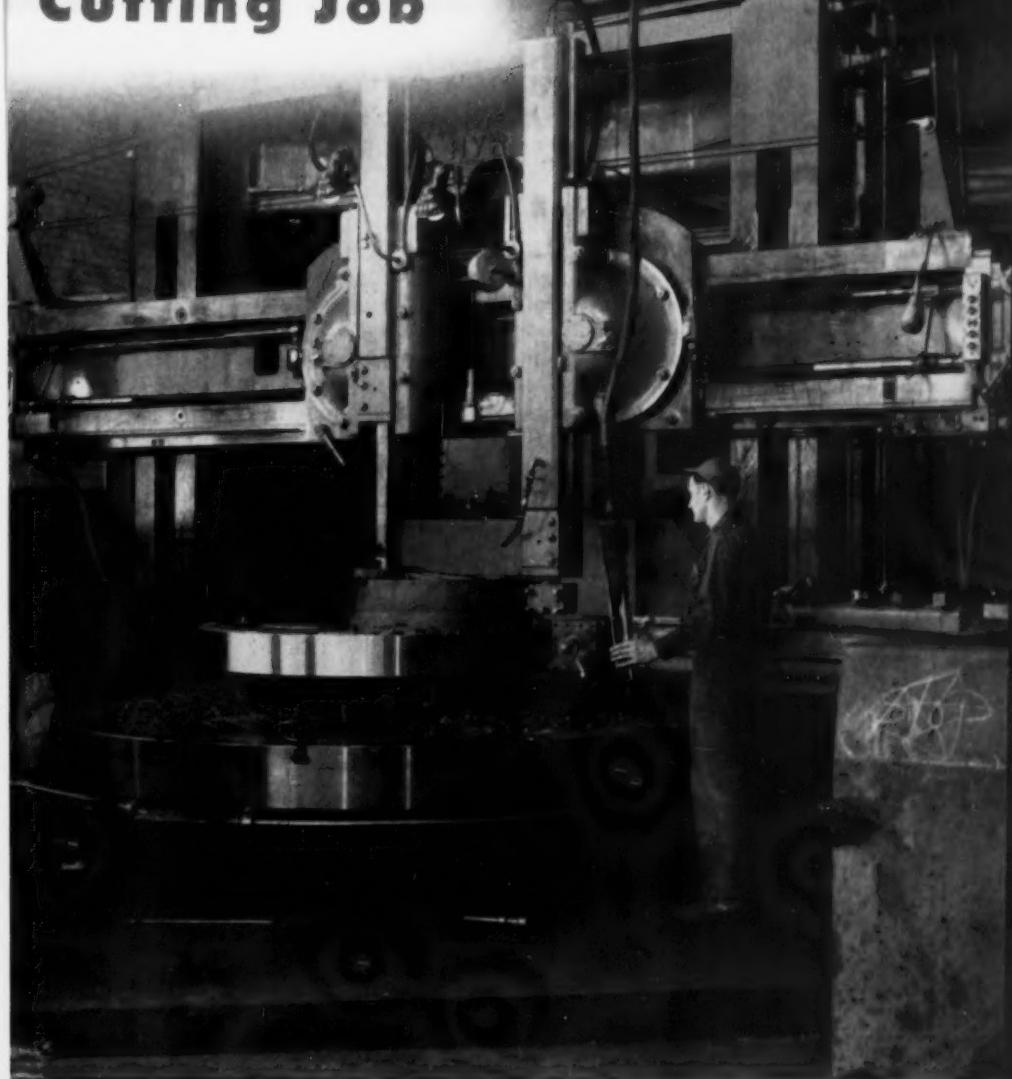
Two rough cuts were made with the Kindex insert before it was indexed to a new cutting edge. Since four cutting points are available on each side of the Grade K21 insert—two turning and two facing—16 rough cuts were made. The insert was then replaced, thus eliminating

the need for expensive regrinding.

The manufacturer reports that, in spite of the extremely uneven surface of the steel gear, the rough turning of its circumference was achieved economically and efficiently with Grade K21, produced by Kennametal, Inc., Latrobe, Pennsylvania. The surface feet per minute rate used for the job is reported as 300. The rate of tool feed was 0.062 inch per revolution of the workpiece; a ½-inch maximum depth of cut was employed.

The Grade K21 carbide applied to this tough machining job is claimed to have unusually high edge strength, a combined resistance to edge wear and cratering, and a high hardness with resistance to breakage. These characteristics, plus a clamped tool design free from brazing strains, are said to drastically reduce down time on heavy steel roughing jobs of the type that was discussed in the foregoing paragraphs of this particular article.

Cutting Job



An eccentric cast steel gear is shown in the process of being rough turned on a large Cincinnati Hypro boring mill using a heavy duty tool equipped with a turnover type carbide insert.

Facing and Deburring

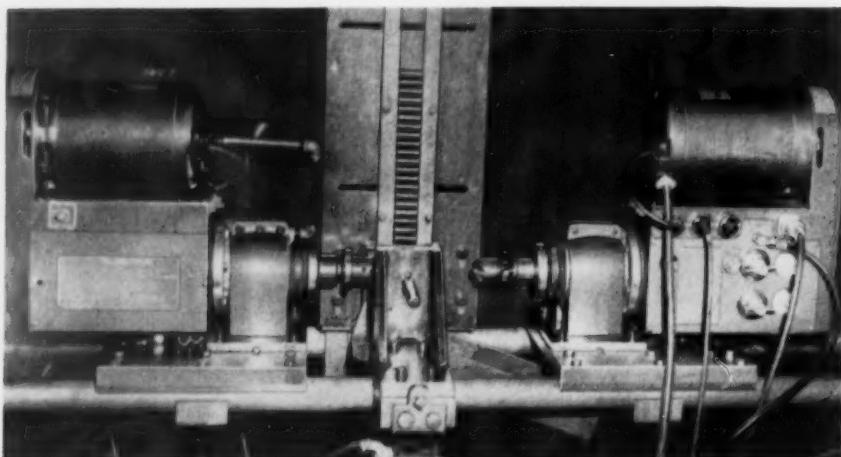
Metal fabricating firm increases production from 135 to 500 pieces per hour with "home-made" automatic drill setup.

By C. NORMAN KIRSCHNER

The discovery that automation can be performed on a small economical scale with stock equipment has led to a considerable production increase for a Chicago metal fabricating firm. A pair of automatic drill units was the only major equipment purchased, yet production has increased from 135 to 500 pieces per hour for the Star Tubular Products Company on a facing and deburring

operation on welded steel pipe sections. The automatic drill units are standard models, made by the Dumore Company of Racine, Wisconsin, with all pneumatic and electric controls built in to simplify installation and reduce control problems.

Formerly, the facing and deburring job required the handling of each part three times—once to do one end, then a separate handling operation



This machine "home-made" by using two automatic drill units and simple feed hopper faces and deburrs over three times as many steel pipe sections as turned out by previous method.

Welded Pipe Sections

to remove the part and reverse it in the work fixture and, finally, the facing and deburring of the opposite end. With the setup now used, the pipe sections are stacked in a hopper, which delivers them to a fixture. As the part falls into the fixture, a clamping device is actuated. This also triggers the two drill units, which advance both drill heads simultaneously, face and deburr both ends of the part and then retract—all automatically. Work feed is controlled through the automatic circuits in the drill units.

Not only has this automatic setup increased production, but the increased accuracy of the finishing process has permitted the company to roll-cut the pipe sections instead of square-cutting, with a resultant reduction in cutoff time.

★ ★ ★

Hydraulic and Pneumatic Power for Production. By Harry L. Stewart. Published by The Industrial Press, 93 Worth St., New York 13, N. Y. 416 pages. Illustrated. Cloth binding, board covers. Price, \$8.50.

This is a comprehensive, well illustrated, clearly written reference book for designers, buyers, installers and operators of hydraulic and pneumatic equipment for production machinery. The book includes information about the basic types of hydrau-

lic and pneumatic equipment and the ways in which they can be applied to the control and actuation of production machinery. In the chapter on hydraulic fluids, both petroleum oils and synthetic fluids are covered in considerable detail. Their various properties are discussed and the common difficulties encountered and their remedies are analyzed. Succeeding chapters cover the various types of hydraulic pumps, filter units, purifiers, accumulators, pipe and tubing, valves, cylinders, intensifiers, motors and heat exchangers. A chapter is devoted to the various methods of synchronizing the movement of fluid power rams and another to hydraulic safety controls. Ways in which sequencing can be obtained by the use of hydraulic controls are also analyzed.

A very thorough coverage of the various types of packings and seals follows the section on hydraulic equipment, and these are illustrated in considerable detail. Their various applications are clearly described.

In the latter part of the book, air filters, lubricators, regulators, controls and cylinders are discussed. Special chapters are devoted to pneumatic safety circuits and to remote control pneumatic systems. A chapter on power holding devices covers various types of hydraulic and pneumatic chucks and mandrels, as well as holding clamps of a wide variety of design and construction.



SIMPLE OPERATIONS CAN MEAN **BIG LOSSES**

By ROBERT J. FLYNN

The difference between a reasonable profit and a disastrous loss on contracts often hinges on adherence to the more routine parts of specifications.

Operating under a major development contract, the XYZ Corporation was required to purchase some extremely precise and costly radar equipment. After working with its subcontractor for over eighteen months, the company was finally able to develop some satisfactory equipment which would function properly when connected with the balance of the instruments being manufactured by XYZ. However, when it was delivered, it was discovered that there had not been any provision for fungus-proofing the equipment.

Since spray treatment was the standard method of XYZ, the company merely sent the equipment over to the fungus-proofing section and had it done by spraying. No further thought was given to the problem until it was time to put the entire system through tests, since the radar

equipment itself had been checked on arrival.

When the tests were made, the system failed to function and it was then that it was determined that the radar was at fault. Further inspection revealed that the spraying of the fungus-proofing on the instrument had thrown it completely off key. For all intents and purposes the equipment was ruined. It was then too late to have the subcontractor do the job correctly at additional cost. In fact, there was no choice but to scrap over \$100,000 in equipment. For the company did contact its vendor for an explanation as to what it should have done.

"Very simple," the vendor's representative answered. "All you had to do was to specify the individual parts that were to be fungus-proofed, disassemble those and treat them separately and then put each parti-

cular part back into its respective assembly.

"For that matter," said the buyer with a note of sarcasm in his voice, "we could have sent it back to you. Such a process would have cost us a fortune.

"That's where you made your mistake. If you actually cost it out you will find that the difference is almost negligible. And, most important of all, it's completely insignificant when you're talking \$100,000 worth of radar."

When the XYZ people did sit down and calculate the difference, they realized what a gamble they had taken. But what is worse, they realized that they had taken the gamble without even knowing that they were doing so. How? Simply because they had one standard practice and everything was put through in accordance with that practice. There wasn't a time that anybody could remember when anybody had examined any new project to see just

how it fit in with the firm's standard practices. *The XYZ company was definitely suffering from a very chronic type of disease.*

The symptoms of the disease are generally a reluctance to spend a penny more than is absolutely necessary for fear of censure and a reluctance to deviate from procedures which, at best, are not written to cover every possible contingency but merely the vast majority of cases.

In many companies routine profitable contracts are turned into loss contracts simply because the standard practices call for more than the contract specifications require. As a result, the manufacturer does a great deal of work for which he does not receive any reimbursement.

But the losses that are the greatest are those, as in the XYZ company, where, in a big contract, the firm neglected to see if the standard practices were suited to the job at hand. And the disasters do not re-



"When tests were made, the system failed to function . . . the radar was at fault."



"The X Y Z company was definitely suffering from a very chronic type of disease."

"... the amount of the loss grows in proportion to the progress of the work . . ."

sult from special tasks such as fungus-proofing alone. They arise most likely from simple operations.

Take for example the case of a very large chassis on which many of the tolerances were 0.0001 inch. The job required an extraordinary number of hours to machine and one of the last operations was the drilling of a hole for a zero pin. Naturally, under ordinary circumstances this would amount to a relatively simple task. But in this case a foreman should have directly supervised the drilling since it was known that if a mistake was made, the chassis could not be reworked. *And when the job was done wrong, not only were the hours lost, although this would have been bad enough, but, in addition, it took some 90 days to replace the castings.* Moreover, instead of pay-

ing a normal amount of money for the castings as had been the case when a large lot was purchased, the replacement cost was some 30 times the original price.

The answer, of course, is either careful supervision in the last stages of a costly project or else the use of higher skilled men.

It is obvious that the amount of the loss grows in proportion to the progress of the work on any job. As factory area expands the insurance manager increases his building insurance. As inventory increases so, too, does the amount of insurance coverage.

The same principle holds true in the manufacture of products. As the costs soar, one should not maintain the same level of insurance. Let us follow a typical case in a com-



"... when the job was done wrong . . . it took some 90 days to replace the castings."



"... the problem is one which can be nipped in the bud . . . where supervision is alert . . ."

| No. | Element Description | Dia. | Tool Type | L.O.C. | RPM | Feed | SFM | Time in Minutes | Labor Grade |
|-----|------------------------|------|-----------|------------------|-----|------|-----|-----------------|-------------|
| 1. | Place in Vise | ... | ... | ... | ... | ... | ... | .08 | 5 |
| 2. | Position Table for Cut | ... | ... | 10 $\frac{1}{2}$ | ... | ... | ... | .06 | 5 |
| 3. | Mill | 4" | Stellite | 4 $\frac{1}{2}$ | 95 | 14 | 65 | .52 | 5 |
| * | ** *** | | *** | | * | ** | | *** | |
| 22 | Drill | .4 | HSS | .4 | 600 | .008 | .. | .10 | 8 |

Table showing data that operation sheet should contain in addition to normal headings.

pany where the estimate sheet goes along all through the job with the operation sheet. Suppose we are to mill a high precision support bracket which will be used on electronic equipment in a plane being manufactured by a large airframe company for the government. The operation sheet would contain the data shown in the accompanying table in addition to the normal headings.

Referring to the table, Labor Grade 3 has an average wage rate per hour of \$2.40. Labor Grade 5 has an average wage rate per hour of \$2.06. Labor Grade 8 has an average wage rate per hour of \$1.58.

Now, looking only at the operation involved and following normal company procedures, the operation sheet specified the lower grade for the operational element as such. But one look at the estimate sheet should show that because of the highly critical nature of the part, the high costs already incurred plus an extremely high casting replacement cost, a much higher labor grade should have been specified.

And what is the cost of this additional "insurance?" A look at the labor rates and the time for the operation will show that the cost per

piece can be calculated in fractions of pennies.

Oftentimes the problem is one which can be nipped in the bud before a bit of work is done where supervision is itself alert and has alerted the employees to be watchful for possible pitfalls. Many times specifications will not come out covering every item down to the last detail. What might look obvious to one company might be completely foreign to another.

Take the case of the company that received a contract to manufacture a relatively simple electronic unit consisting of stacks of condensers and coils. The individual condensers and coils were held together by friction while the stacks would be held together by pins running from one end of the container to the other. Upon completion of assembly work, the whole box would be dipped in a plastic coating and sealed. After this last operation, of course, no rework could be done on the item.

To an organization specializing in this type of work, the manufacture of this item probably would not have been too great a problem if the company knew the end use and exactly what the instrument was required to

"...the attention to detail that goes into computing a price is completely lost . . ."

do. But how much this company knew about this type of product was obvious when it was discovered that it had used standard "off-the-shelf" steel pins to hold the stacks of condensers and coils together. The company had not taken into consideration the fact that the steel pins would render the instrument completely erratic. In this particular case only wooden or plastic pins could have solved the problem. This instrument was to be used to pick up just certain signals out of many coming into it, and the presence of the steel resulted in a merging of several of the signals.

Consequently, when the Bill of Materials was being prepared by someone who was not being paid to question such items, he merely set down on the Bill the standard pins used in similar products put out by his company. But if the specifications had been reviewed and it had been a set policy of the company to make such a review on all new items, this error undoubtedly would have been caught.

Far too often is it found that the attention to detail that goes into computing a price is completely lost due to the fact that those who will be connected with the design and manufacture of the product do not realize that *just because somebody has awarded the company a contract does not mean that all thinking has to stop and every step to be done can be done mechanically.*

Someone once said that a proce-

dure is like a pipe through which a liquid is poured. Inside the pipe it becomes a steady stream and the nozzle on the other end enables it to emerge in the exact form desired. As a general principle this is sound—as long as you use the same type of liquid. But beware of the liquids that might destroy your pipeline. For a new liquid, you may need a different type pipe or at least a new nozzle. Standard practices, like form contracts, are most necessary in business. But woe be to the real estate man who uses a form contract drawn for use on cemetery plots for the sale of the Empire State Building.

However, over and above the procedure or practice is the human element. *No tool, whether it be the chisel in the hand of a sculptor or*



"...because somebody has awarded the company a contract does not mean that every step to be done can be done mechanically."



"No tool, whether it be the chisel in the hand of a sculptor . . . is better than the individual who operates the tool."

the standard practice in the hands of a production manager, is better than the individual who operates the tool. Therefore, it is incumbent on management to drill into supervisors the fact that there has not ceased to exist in American factories the need for industrial imagination. It should be stressed that the difference between just any clerk and a top-notch supervisor is the ability of the latter to adapt the standard practices of his firm to the needs of his customer.

★ ★ ★

Industrial Lubrication Practice. By Paul D. Hobson. Published by The Industrial Press, 93 Worth St., New York 13, N. Y. 548 pages. 167 illustrations. 45 charts and tables. Cloth binding, board covers. Price, \$8.00.

The primary emphasis of this book is on practice—on the practical application of sound lubrication theory and methods to the efficient mainte-

nance and operation of a wide range of mechanical equipment and machinery. Enough theory is presented in the early part of the book, however, to provide an adequate basis for the reader's understanding of those technical references necessary in the discussion of techniques and practice which constitute the major part of the work. The intention is to provide basic information on lubrication practice that can be used by the technical man who may have received his training and previous experience in some other field, and that will serve as a foundation for the body of specialized knowledge that he is building up.

The scope of the work is somewhat wider than just that of lubrication, since a very large number of the troubles that the lubrication engineer may be called in to rectify are not, in fact, due to faults of lubrication, but are rather symptoms of some fault in machine operation, design or construction. A considerable amount of information is therefore given about the general operation of various kinds of equipment, prime movers and machinery and the difficulties which may arise from causes other than faulty lubrication. The book provides a most informative survey of the many oils, greases and solid lubricants, both natural and synthetic, that are now available and points out their specific advantages and disadvantages, as well as the applications for which each is best suited. The different kinds of plain and anti-friction bearings that are used in present-day machinery are described, together with the ways in which these bearings function.

Draw Former Adapted to

Chance Vought Aircraft Plant employs draw forming

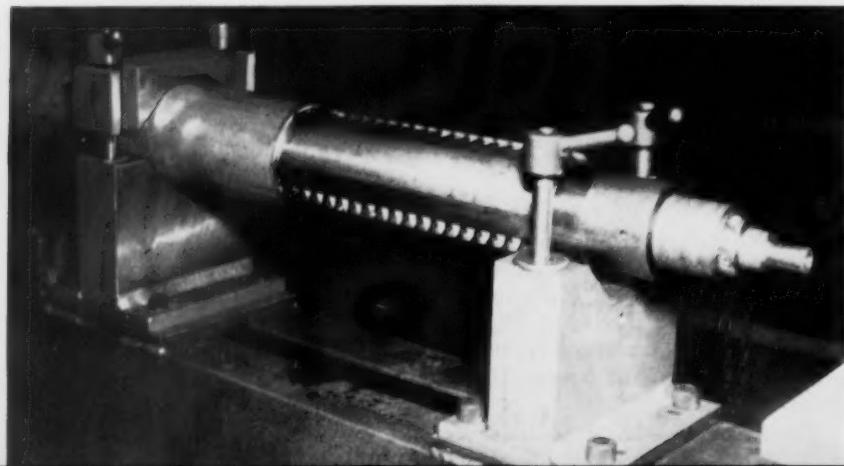
By JOHN INNES

A unique use of a Cyril Bath draw forming machine to do internal broaching on a 9-foot 61ST6 aluminum tube has been developed by tool research engineers at the Chance Vought Aircraft Plant in Dallas, Texas. The problem was to cut down internal ridges running the length of the long tube 30 to 60 thousandths of an inch. The ridges had to be flat on top.

A draw rod about 10 feet long, with a quick disconnect, was attached to a mandrel containing three broaches and three floating wear

plates, both adjustable as to diameter. This rod was attached to the 25-ton draw head on the Bath machine. The aluminum tube was clamped in a V-block fixture and tightened snugly to prevent jumping. The broach was pulled through the tube slowly five times to make the desired cut in the ridges.

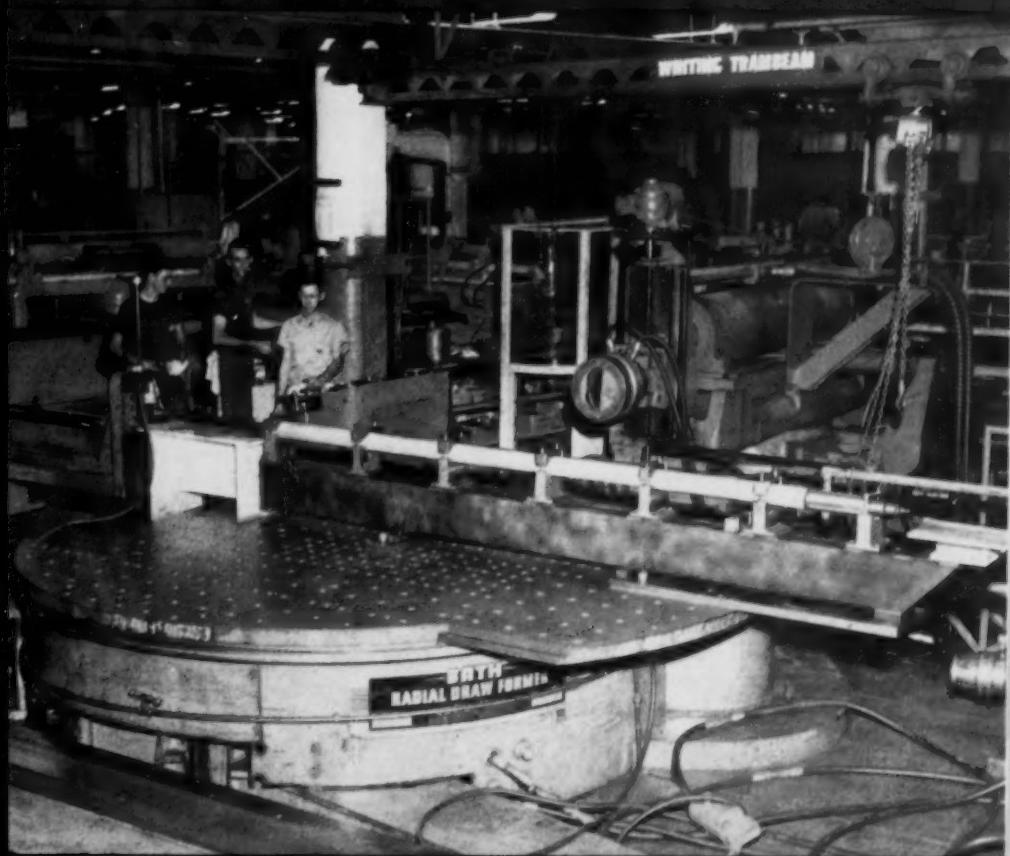
The tube had proved too long to do the job on a broaching machine table. Use of a long planer was ruled out because of the danger attendant with rapid starting and stopping of the bed of the machine.



Close-up view of broach installation. Tube on left is held in a V-block. Teeth of broach are visible; also wear plate is between them. V-block on right is used for longer tubes.

Internal Breeching Job

Machine to internally smooth 9-foot aluminum tube.



Overall view of Cincinnati Radial Draw Forming machine, with nine-foot aluminum tube installed and ready to be drawn on the extreme right end to be pulled through it.

HAVING TROUBLE DRILLING CONCENTRIC HOLES
IN PINS? TRY THIS METHOD!

• • • • • • • • • • • • • • •

Machining Stainless Steel

A case history pointing out how difficulties were eliminated in deep-drilling a concentric hole in a stainless steel pin.

By G. J. STEVENS

Machining Engineer, Armco Steel Corporation, Middletown, Ohio

OPERATION:

Deep-drilling of a straight stainless steel pin while held in a lathe collet.

PROBLEM:

A slanting (non-concentric) or oversized hole was produced in the pin.

SOLUTION:

The unsupported portion of the pin inside the collet has a tendency to whip out of alignment (Fig. 1). To keep the pin straight, insert a bushing in the back end of the collet (Fig. 2). Or, if there are center holes in the pin, fit the collet with a center support (Fig. 3).

In addition to positive alignment of the work, a correctly sharpened drill and suitable speeds are essential to the production of a clean concentric hole in the workpiece.

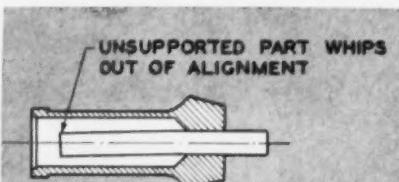


FIG. 1



FIG. 2

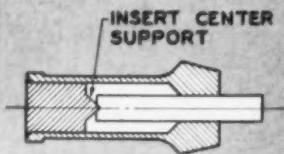
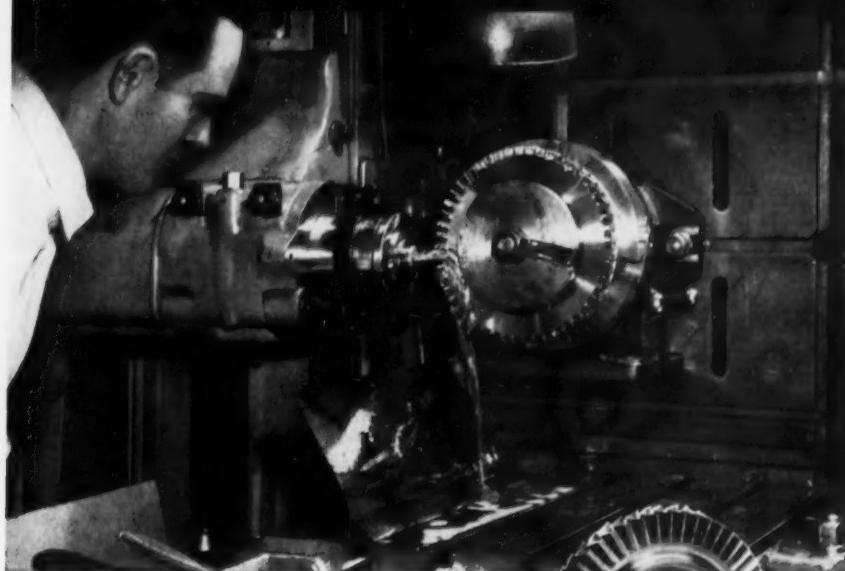


FIG. 3



uses SUPER-SPACER on intricate Milling Operation



Photos
courtesy
Pratt &
Whitney
Co., Inc.

Tracer-controlled milling of the 51 integral blades of this precision turbine rotor required machining and indexing facilities of great accuracy.

Pratt & Whitney engineers solved the problem using a Keller Machine and a Hartford Special 8" SUPER-SPACER. Result — a job well within the $\pm 0^{\circ} 1'$ spacing tolerance permitted.

Write today for details on the Super-Spacer, the versatile, fast, accurate indexer that pays for itself over and over again on long or short run production. Ask for Bulletin S-104.

MACHINE TOOL ACCESSORIES DIVISION
THE HARTFORD SPECIAL MACHINERY CO.
275 HOMESTEAD AVE., HARTFORD 12, CONN.

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March, 1956

modern machine shop 123

HARTFORD
Special

Carbide Tools Reduce Gear Making Costs

Eastern gear manufacturing plant nearly doubles production with long-life multiple tool setup.

Tool costs were reduced from **9 cents to 2 cents per piece** and the production rate was nearly doubled in an eastern gear manufacturing plant as the direct result of a switch to Wessonmetal "26" carbide tools. The operation consists of facing and rough turning alloy steel stem gears (32 Rockwell C) on a 20-inch Fay automatic lathe. Eight Wesson brazed-type flat tools and one Multicut insert holder are used in the multiple tool setup.

Formerly the job was done at 525 r.p.m. and 270 s.f.p.m. After the change to Grade "26", Wesson Com-

pany tool engineers recommended an increase in the production rate to 580 r.p.m. and 305 s.f.p.m. Even with the increased production rate, tool life has shown a marked improvement.

Depth of cut now averages $3/16$ inch, resulting in a 25 per cent reduction in machining time from 2 minutes formerly to $1\frac{1}{2}$ minutes per piece with the present tooling. This stepped up rate plus lower down time for tool change due to longer tool life has nearly doubled hourly production to 50 gears per hour compared with 30 gears formerly.

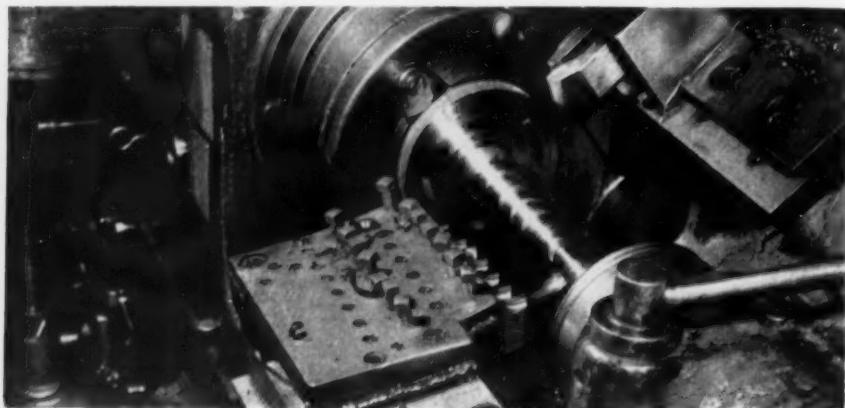
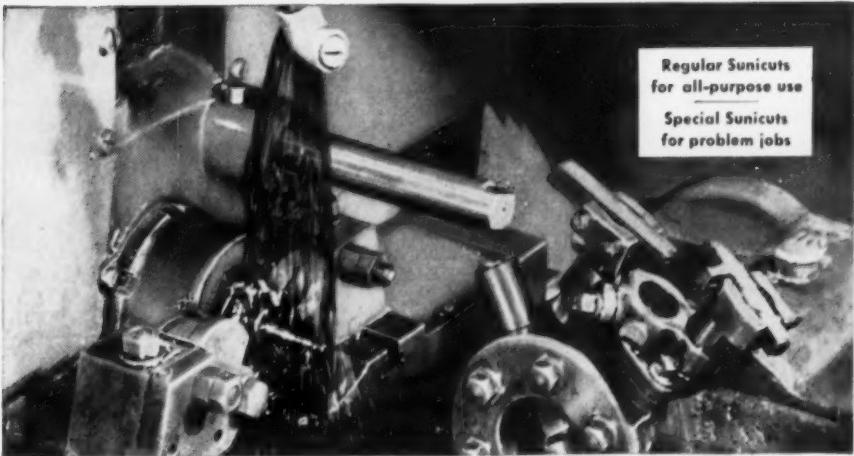


Illustration showing multiple tool setup utilizing eight brazed-type flat tools and one Multicut insert holder for use in turning alloy stem gears on an automatic lathe.



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for all-purpose use

Special Sunicuts
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To assure peak production . . .

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Your Sun representative has the practical know-how to analyze *your* problems. With Sun's experienced engineers, he's ready

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SEE THIS NEW PRODUCT AT
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announcing NEW METCUT Pin-Mount CORE DRILL

Improved 2-Piece Design Provides Over
60% MORE SPACE for Chip Removal

This new METCUT Pin-Mount Core Drill is a tool you can depend upon for faster cutting action and longer, trouble-free service because the new design provides up to 60% more space for chip removal. The replaceable cutters in either carbide or high speed, are accurately positioned and driven by means of four pins, and are quickly and easily removed by a simple Allen head cap screw. No drifts are required. Gap between tool body and cutter section is also eliminated. Chip flow is smooth. There is no lodging or packing. Since drifting is no longer required, you eliminate the danger of damaging tools and spindles, insuring greater accuracy and tool life.

Sizes Available from $\frac{3}{4}$ " to 5"

Of special importance is that now you can apply the advantages of the two-piece design to a wider variety of jobs. Small sizes as low as $\frac{3}{4}$ " are now available. Other sizes are provided in diameters up to 5". Furthermore, the new design will help you reduce setup costs because cutters can be easily removed without taking the body of the tool from the spindle. You replace cutters, which can be sharpened in sets, without readjusting spindles. This is of particular advantage where guide bushings and plates are used.

Patents Pending

Securely Held by Cap Screw.
Quickly, easily removed by hand.

Accurate, Plush Fit — No Gap
for Chips to Lodge or Pack



ORDINARY DESIGN
— Secured by
Shank and Socket



PIN-MOUNT DESIGN — Deep-
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space for chip disposal.

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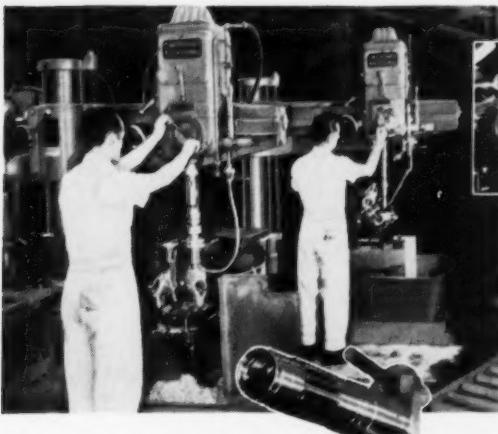


Cincinnati Bickford

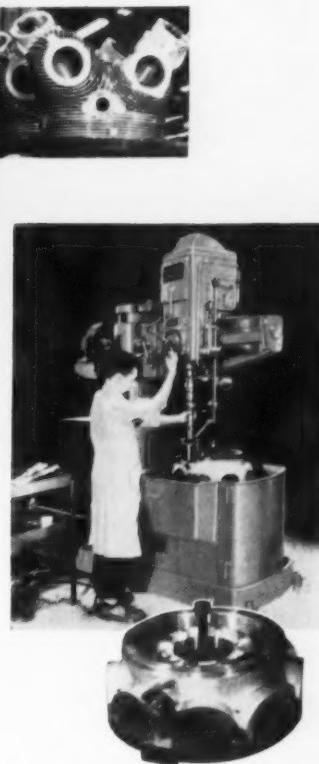
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REQUIREMENTS AT Canadian Pratt & Whitney

Aircraft Company LIMITED



Drilling, Core Drilling and Reaming Alloy Steel Cheek and Counterweights of Aircraft Engine Crankshafts. Reamed holes are held accurate within .0005". Second machine is boring and facing Inlet and Exhaust Ports on Cast Aluminum Cylinder Heads.



Six Cincinnati Bickford 9" column Super Service Radial Drills have given a fine performance and established a record for accuracy and reliability, and have met production problems at Canadian Pratt & Whitney Aircraft Co., Ltd. Modern Cincinnati Bickford features for convenient easy handling, power and speed have made these machines highly profitable. Investigate these money makers.

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Photos courtesy of Canadian Pratt & Whitney Aircraft Co., Ltd.
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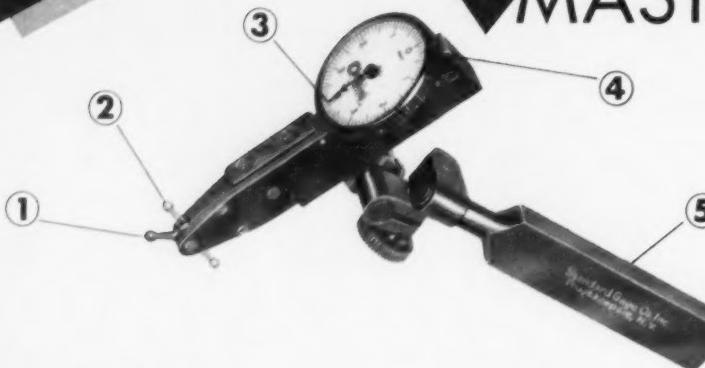
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March, 1956

modern machine shop 127

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the CHECK ✓MASTER



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- ③ Clockwise movement of hand for both directions of contact point. Directional reverse-lever eliminated.
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SUSPENSION BEARINGS at a fraction of their former cost!

Total floor to floor time for
Duplicating Lathe operations

52 minutes

The technique and production time used in this text were taken from actual performance in two of the nation's leading railroad shops.

A complete time study including all pertinent data is available upon request.

This is only one of the Diesel engine component jobs that "American" Hydraulic Duplicating Lathes are performing at record low cost in many of our leading railroad shops. Never has the need for economies in railroad operation been more urgent. Never has there been a better opportunity for effecting economies in the railroad shop than offered by the

"American" Hydraulic Duplicating Lathe.



THE AMERICAN TOOL WORKS CO.

Cincinnati 2, Ohio, U. S. A.

LATHES AND RADIAL DRILLS

Way Machine Tooled for Refrigerator Parts Production

Four-station indexing fixture permits boring, counterboring and chamfering offset opposing cylinders.

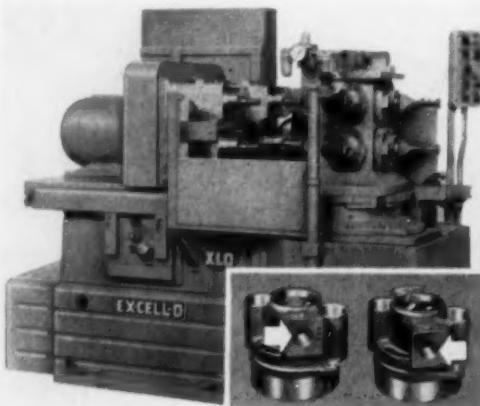
The accompanying illustration shows a standard Ex-Cell-O Style 54 One-Way Machine, which has been adapted to the processing of cast iron compressor crankcases. Using a four-station indexing fixture, the machine bores, counterbores and chamfers two offset, opposing cylinders, holding to accurate dimensional limits. Comparable accuracy is also achieved in holding the relative positions of the cylinder bores to the main crankcase bearing.

In this Ex-Cell-O machine application, the two crankcases are loaded one above the other, at each of the four indexing stations. The loading is performed at the right of the indexing fixture, while other parts are being machined at the front and rear stations. The parts are air clamped in position. A safety device is provided to retain parts on the fixture, should air pressure fail.

A motor-driven mechanism turns the fixture and a wedge-type shot bolt positions the fixture radially. During machining operations, the fixture is held down by hydraulic pressure to insure a firm bearing. This pressure automatically releases

for indexing movements. Until the bearing is established, a safety switch prevents the tool spindles from approaching the workpiece.

The operating cycles of the machine are fully automatic, except for loading and unloading. The unit can easily be rearranged for entirely different production runs, the only modification necessary being a change in the fixtures and tooling.



Ex-Cell-O Way Type Precision Boring Machine, with inset showing compressor crankcases and arrows pointing to bored cylinders.

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and increase production!*

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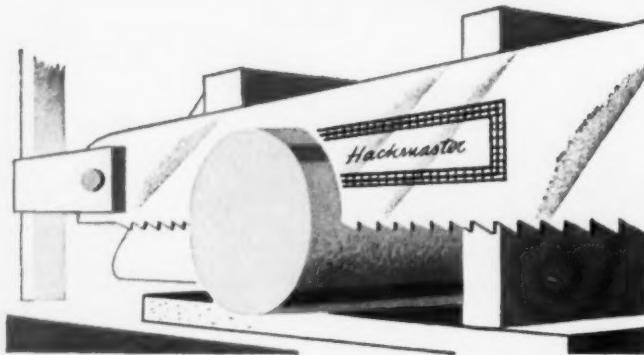
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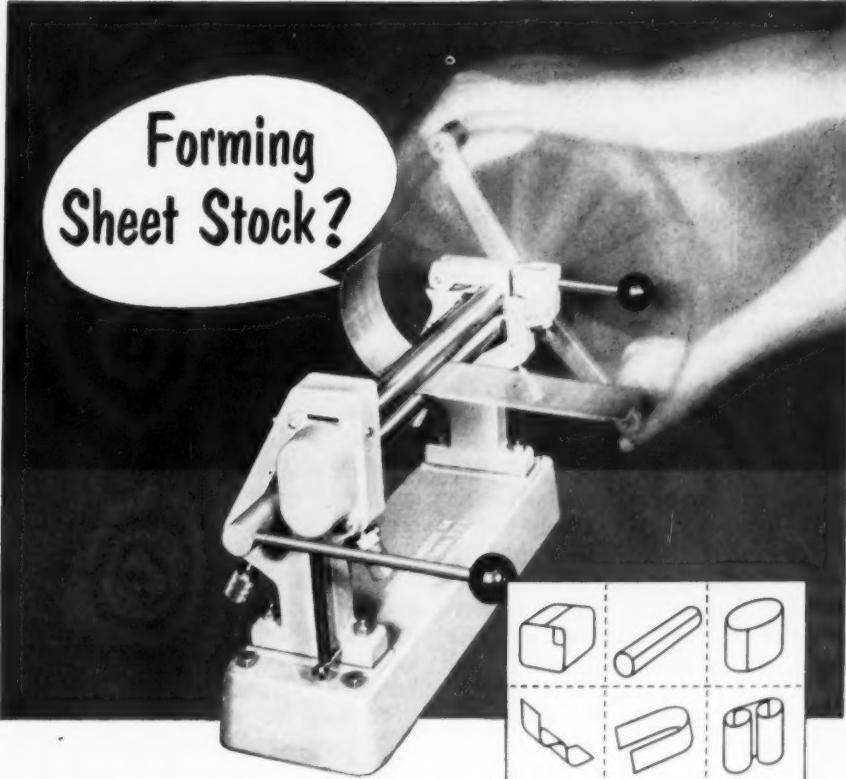
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LENOX also presents the famous Mo-Speed Power Blades for spectacular performance on routine metal cutting jobs.

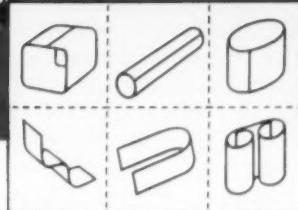
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March, 1956

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ASTE INDUSTRIAL EXPOSITION THEME

Tooling for

Chicago to be host to the "Tool Show" from March 19 through 23.



In recent years, the Industrial Exposition sponsored by the American Society of Tool Engineers has become the biggest biennial event in the metalworking field. This year's Exposition, being held March 19 through 23 at Chicago's International Amphitheatre, is no exception. The national society officers and the headquarters staff plus more than 100 Chicago area executives and engineers have worked for months to complete the arrangements for the huge Industrial Exposition and the Convention.

Approximately 40,000 manufacturing executives, supervisors and engineers from companies representing over 90 per cent of the nation's total production capacity are expected to attend the Exposition and the concurrent technical conferences. Sixty of the nation's leading executives and engineers will speak on the latest developments in production equipment and processes during the five days of the annual Convention. Co-sponsors with ASTE of several important papers include Armour Research Foundation, the National Tool and Die Manufacturers Asso-

ciation, and the National Fluid Power Association.

In recognition of the tremendous strides in production tools and accessories ASTE has selected the theme "Tooling for Tomorrow." Technological changes are coming about so rapidly that new tooling concepts must result. A thorough review of present tooling facilities has become a virtual necessity.

Tooling is a commodity that must be critically analyzed at regular intervals and particularly at this time because: Problems associated with increased operating costs are becoming even more acute in our present expanding economy; Population increases and rising standards of living are snowballing the demand for consumer goods to such a degree as to, in themselves, make present production methods and facilities inadequate; Rapid technological developments and scientific advances are providing improvements so rapidly that new equipment is becoming obsolete much more quickly. Continual replacement or modernization of facilities has become a must for most organizations in order

Tomorrow

to remain competitive; Tax law liberalization with regard to amortization may make a reconsideration of tooling programs much more attractive than in years gone by; Recent developments in the automatic control of machines now makes it possible for even small limited-production manufacturers to use automation economically; New "wonder materials" and processes for tooling and manufactured products are becoming available almost daily. Utilization of these to best advantage will necessitate completely new tooling.

The Industrial Exposition will provide the visitor with a market place for ideas where he will be able to compare advanced ideas of the latest in tooling. Also of interest to those who come to Chicago during the week of March 19 will be the

fourteen inspection visits to observe manufacturing operations in Chicago area plants. A wide variety of the most modern production processes and equipment will be covered.

A new idea to spotlight the most significant developments in industrial exhibits will be a feature of the Industrial Exposition. Approximately 480 Blue Ribbons will be displayed on the outstanding production equipment, accessories, inspection and gaging devices, and so on, that will be exhibited. The Blue Ribbon selections idea is designed to point out the outstanding "high spots" of the Exposition, particularly for the visitor who has only a limited amount of time to see the many products on display. The Blue Ribbons will be distributed before the show opens so that every visitor



View of Chicago International Amphitheatre, scene of A.S.T.E. Industrial Exposition.

Tooling for Tomorrow . . .

will immediately be able to spot the latest tooling advances without any lost motion. Then each visitor will be able to spend his remaining time at the Industrial Exposition going into further detail on the various exhibits or items that are of special interest to him.

Manufacturing executives, engineers and others who have made outstanding contributions to tool engineering and manufacturing techniques in general will be honored during the week of the Convention and Industrial Exposition. These awards include: The ASTE Progress Award, honoring accomplishment in the field of manufacturing techniques or production methods; The ASTE Gold Medal, honoring outstanding service through published literature, technical writings or papers; The Joseph A. Siegel Memorial Award, a memorial award in memory of the Society's charter president honoring contributions by an ASTE member through leadership, voluntary support or timely acts of benefit to the Society; the ASTE Engineering Citation, honoring unusual skill by an ASTE mem-

ber in the development of tool engineering principles.

Co-sponsor with ASTE in a Symposium on natural and synthetic diamonds will be the Armour Research Foundation, one of the oldest and best known research foundations in the country. Opening a 13-paper Diamond Symposium, which is one of the most comprehensive presentations on a vital technical subject ever undertaken by a major technical society, will be a discussion of the current status of man-made diamonds, their properties and possible future uses. Speaker at this opening Diamond Dinner to be held on March 19th at Armour Research Foundation will be J. S. Gillespie who is in charge of the man-made diamond project at the Carboloy Department of General Electric Company. Master of ceremonies for the dinner will be Dr. John T. Rettalata, president of Illinois Institute of Technology and Armour Research Foundation.

Sharing the limelight for the evening will be a \$4 million display of man-made, gem and industrial diamonds including a \$1,000,000 display at the Exposition proper. Special provisions will be necessary to safeguard this valuable display.

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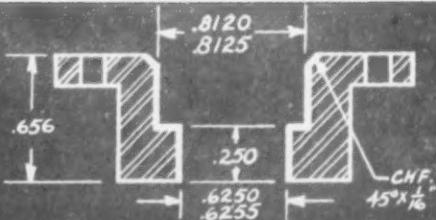
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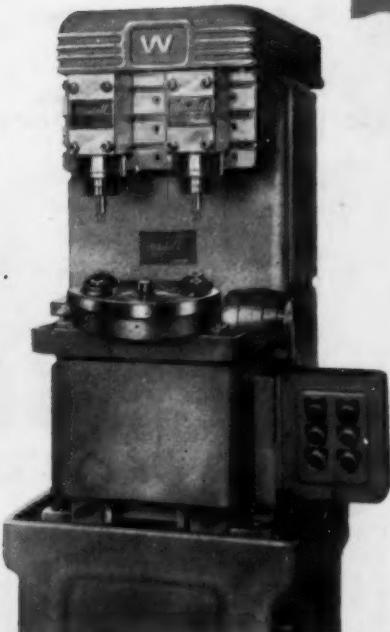
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A typical example of the productive capacity of this machine:

MATERIAL - cast iron.
Operation performed (see drawing above),
Loading and Unloading - Manual.
Tooling: Automatic positioning table,
Diaphragm type chucks.

GROSS PRODUCTION - 600 pieces per hour.



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Tooling for Tomorrow . . .

At the Exposition itself, the industrial diamonds will be displayed in an exhibit that will also house an actual diamond workshop in which several diamond cutters will be producing diamond tools on special machinery shipped to the show from South Africa and Europe. A working model of the Premier Diamond Mine will give visitors first-hand knowledge of the workings of one of the most zealously guarded operations.

The following sessions Tuesday

and Wednesday, March 20th and 21st, will have a decidedly international flavor as speakers from Johannesburg, Antwerp and Amsterdam alternate with those from Terre Haute, Paterson and Detroit in presenting topics concerned with the production, selection and industrial utilization of diamonds. Among the topics to be discussed include: Diamond structure, uses of industrial diamonds, suggested standards, selection and specific applications.



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Technical Program

ASTE 24th Annual Meeting

During Exposition hours, all Industrial Conferences will be held in Rooms A, B and C located on the 2nd floor of the North Hall, in the International Amphitheatre.

NEW MATERIALS DAY

MONDAY, MARCH 19

1:30 P.M. WHAT ABOUT CERAMIC CUTTING TOOLS?

- Room A Chairman: Wm. Cleary, Jr., Shop Supervisor, Caterpillar Tractor Company
"CERAMIC TOOLING BROUGHT UP TO DATE," by W. B. Kennedy, Chief, Experimental Machining Branch, Rodman Laboratory, Watertown Arsenal.
"CEMENTED BORIDES FOR TOOL MATERIALS," by A. G. Metcalfe, Senior Metallurgist, Armour Research Foundation.

2:30 P.M. WORKING THE "WONDER" MATERIALS

- Room B Chairman: Wm. G. Bylsma, Tool & Die Supervisor, Steel Case Inc.
"THE DRAWING OF TITANIUM," by J. S. Kirkpatrick, Vice President, Brooks & Perkins, Inc.
"MACHINING WITH SILENT SOUND," by Jack Welch, Manager, Machine Tool Division, The Sheffield Corporation.

3:30 P.M. WHAT'S NEW IN GRINDING?

- Room C Chairman: E. Ted Neubauer, Senior Development Engineer, Trane Company
"RECENT ADVANCES IN GRINDING WHEELS," by Carl Soderlund, Sales Engineer, Norton Company.
"PRECISION PRODUCTION GRINDING MACHINES," by A. H. Dall, Director of Standard Machine Tool Engineering, The Cincinnati Milling Machine Company.
"ELECTRICAL DISCHARGE GRINDING OF TOOLS," by V. E. Matulaitis, Director of Research, Elox Corporation of Michigan.

SHAPED DIAMOND TOOL SYMPOSIUM

- Commons Bldg., Illinois Inst. of Technology
Master of Ceremonies: Dr. D. J. Retaliata, President, Illinois Institute of Technology
Dinner: 6:30 P.M. (Dinner tickets must be purchased in advance of meeting.)
"MAN-MADE DIAMONDS," by J. S. Gillespie, Manager, Diamond Project, Carboley Department of General Electric Company.

RESEARCH DAY

TUESDAY, MARCH 20

9:30 A.M. SHAPED DIAMOND TOOL SYMPOSIUM

- Room A Chairman: Dr. Leonid V. Azaroff, Research Physicist, Armour Research Foundation
"CRYSTALLOGRAPHY AND GRINDING HARDNESS OF THE DIAMOND CRYSTAL," by

5346

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THE HANDY HAMILTON PORTABLE ELEVATING TABLE

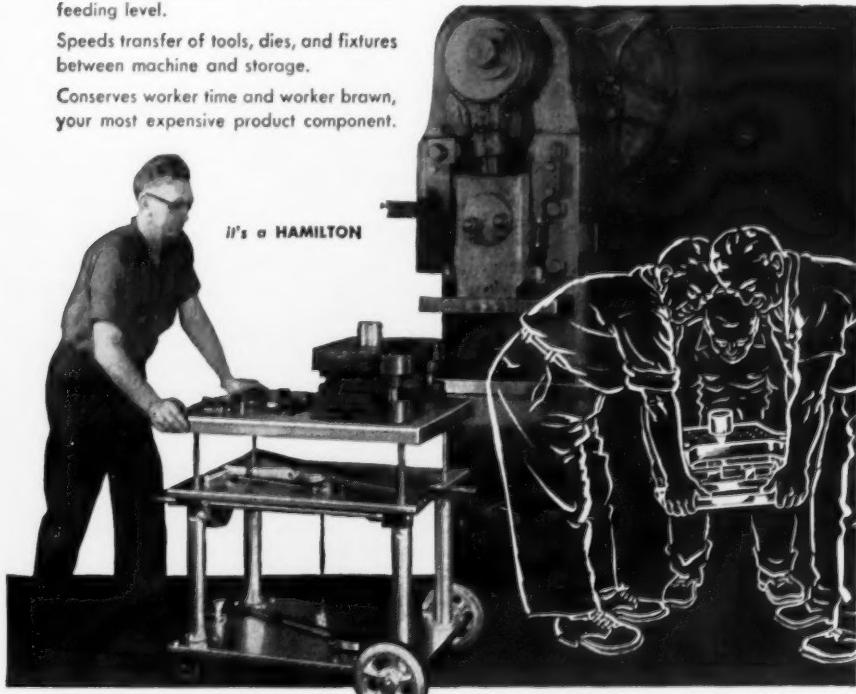
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Conerves worker time and worker brawn, your most expensive product component.

Reduces injuries to workmen, and damage to tools and materials due to manual handling.
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ASTE Technical Program...

Dr. J. F. H. Custers, Director of Research, Diamond Research Laboratory.

"THE SELECTION, DIVISION AND SHAPING OF DIAMOND FOR THE MANUFACTURE OF DIAMOND TIPPED TOOLS," by R. G. Weavind, Director of Research, Diamond Research Laboratory.

"SOME ASPECTS OF THE BATCH PRODUCTION OF DIAMOND TOOLS," by N. R. Smith, Director, L. M. Van Moppes and Sons, Ltd.

9:30 A.M. AUTOMATING THE INDIVIDUAL MACHINE

- Room B Chairman: Maurice J. Ullman, Chief Tool Engineer, Swan Engineering & Machine Co.
"THE TOOL ENGINEER'S FUNCTION IN NUMERICAL CONTROL," by J. Daugherty, Vice President-Engineering, Giddings & Lewis Machine Tool Company.
"THE USE OF PUNCHED CARDS FOR MACHINE CONTROL," by J. J. Jaeger, Vice President, Chief Engineer, Machinery Division, Pratt & Whitney Co., Inc.

10:30 A.M. MACHINE TOOL ECONOMICS—RENT OR BUY?

- Room C Chairman: Carl A. Darger, Owner, C. A. Darger & Associates
"THE CASE FOR BUYING MACHINE TOOLS," by George Terborgh, Research Director, Machinery & Allied Products Institute.
"ECONOMICS OF REPLACING MACHINE TOOLS BY EQUIPMENT RENTAL," by F. J. Trecker, President, Kearney & Trecker Corporation.

1:30 P.M. SHAPED DIAMOND TOOL SYMPOSIUM

- Room A Chairman: L. E. Doyle, Mechanical Engineering Department, University of Illinois
"DIAMOND DRESSING OF FORM GRINDING WHEELS," by Jack Bryant, Process Engineer, Allis-Chalmers Manufacturing Company.
"SHAPED TOOLS FOR FORM GRINDING FROM THE MANUFACTURERS' VIEW POINT," by J. B. Speirs, Chief Engineer, American Coldset Corporation.
"SUGGESTED STANDARDS FOR DIAMOND TOOL SHANKS," by Martin Hoerer, Vice President, Golconda Corporation.

2:30 P.M. PLASTIC TOOLING CHALLENGES THE TOOL ENGINEER

- Room B Chairman: Harry J. Moffatt, Supt. of Tools & Supplies, Caterpillar Tractor Company
"ADVANTAGES OF PLASTIC TOOLING," by Fred Lyijnen, Supervisor, Plastics Development Dept., Auto Body Division, Chrysler Corporation.
Interview Panel
John Mickey, Manager, Research Dept., Ford Motor Company.
Robert H. Voss, President, Warren Plastics & Engineering Inc.
E. R. Kalis, General Foreman, Fisher Body Division, GMC.

3:30 P.M. PROFESSIONAL ENGINEERING—HOW AND WHY

- Room C Chairman: Leslie C. Seager, Production Engineer, Eimco Corporation
"WHY REGISTER," by Paul H. Robbins, P. E., Executive Director, National Society of Professional Engineers.
"HOW TO BECOME A REGISTERED PROFESSIONAL ENGINEER," by John D. Constance, P. E.



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There is no way under the sun to do small, precision tapping with "production" speed, satisfactory tap life and acceptable accuracy, other than to use a tool designed for the specific purpose.

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ASTE Technical Program..

8:00 P.M. TOOL ENGINEERING RESEARCH IN ACTION

Beverly
Room
Conrad
Hilton

Chairman: Wallace E. Carroll, President, Simpson Electric Company
"METHODS OF APPLYING CUTTING FLUIDS," by Prof. M. C. Shaw and Prof. P. A. Smith, Machine Tool Laboratory, Massachusetts Institute of Technology.
"METAL-CUTTING EVALUATION," by F. J. Dassch, Chief Machinability Engineer, Rock Island Arsenal Laboratory.

8:30 P.M. SOLVING CARBIDE DIE PROBLEMS

Waldorf
Room
Conrad
Hilton

Chairman: Willis G. Ehrhardt, Managing Partner, Ehrhardt Tool & Machine Company
"MACHINING CARBIDE DIES BY THE ELECTRICAL DISCHARGE METHOD," by J. K. Carroll, Executive Vice President, Electrosize, Inc.
"HOW TO HELP THE DIE BUILDER GIVE YOU SATISFACTION," by H. Harig, President, Harig Manufacturing Corporation.
"WHAT THE STRIP STEEL MANUFACTURER SHOULD KNOW," by Burton E. Longwell, Asst. Manager of Sales, Republic Steel Corporation, Sheet & Strip Division.
"THE DIE BUILDER ASKS FOR HELP," by Don E. Oberg, President & General Manager, Oberg Manufacturing Company, Inc.
"APPLICATION OF CEMENTED TUNGSTEN CARBIDE FOR DIES," by P. F. Rehner, Manager of Sales, Carmet Division, Allegheny Ludlum Steel Corporation.
"THE STAMPER AND DIE BUILDING," by Thomas C. Roberts, President, Kobzy Tool Company.

NEW PROCESSES DAY **WEDNESDAY, MARCH 21**

9:30 A.M. SHAPED DIAMOND TOOL SYMPOSIUM

Room A

Chairman: Adam F. Gabriel, Acme Industrial Company
"USE OF INDUSTRIAL DIAMOND AND DIAMOND TOOLS IN INDUSTRY," by D. J. Wallace, Vice President, Wheel Trueing Tool Company.
"THE USE OF DIAMOND TOOLS FOR TURNING AND SHAPING OF SMALL PARTS," by L. A. Hurwitz and R. A. Kurtz, Hamilton Watch Company.
"APPLICATION OF DIAMOND TOOLS TO TURNING, BORING AND REAMING," by Joseph Klipper, Vice President & General Manager, Clipper Diamond Tool Company.

9:30 A.M. ECONOMICAL PRODUCTION OF FINE PITCH GEARS

Room B

Chairman: Fred C. Freund, Works Manager, Giddings & Lewis Machine Tool Company
"AN OBJECTIVE LOOK AT THE FIELD OF INSTRUMENT GEARING," by Louis D. Martin, Gear Consultant, Eastman Kodak Company.
"GEARS GAGING AUTOMATION," by T. S. Gates, Chief Engineer, National Broach & Machine Company.

10:30 A.M. ELECTRONIC CALCULATORS AND THE TOOL ENGINEER

Room C

Chairman: John R. Baker, Master Mechanic, Norge Division, Borg Warner Corporation
"INTRODUCING COMPUTERS FOR MACHINE TOOL CONTROL," by J. J. Stone, Asst. Chief, Electrical Engineering Division, Battelle Memorial Institute.

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- finish smooth

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service.

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ASTE Technical Program...

"THE MACHINABILITY COMPUTER," by Dr. W. W. Gilbert, Consultant Machinability Development Service, General Electric Company and E. J. Weller, Carboly Dept. of General Electric Company.

1:30 P.M. SHAPED DIAMOND TOOL SYMPOSIUM

- Room A Chairman: S. E. Rusinoff, Dept. of Mechanical Engineering, Illinois Institute of Technology.
"CEMENTED PARTICLE DIAMOND TOOLS," by C. Law McCabe, Metals Research Lab., Carnegie Institute of Technology.
"THE SELECTION OF DIAMONDS FOR VARIOUS APPLICATIONS," by Dr. G. P. Freeman, D. Drukker and Zn. N. V.
"CUTTING OF GLASS, FERRITES, CARBIDE AND CERAMICS," by Leon Van Geersdaele, Diamant Bort.

2:30 P.M. AUTOMATION AND TOLERANCES AFFECT JIG AND FIXTURE DESIGN

- Room B Chairman: R. M. Knabe, Master Mechanic, J. I. Case Company
"IMPACT OF HIGH ACCURACY (LOW TOLERANCE) REQUIREMENTS ON JIGS AND FIXTURES IN MASS PRODUCTION," by A. V. Bodine, President, The Bodine Corporation.
"AUTOMATION—ITS EFFECT ON JIGS AND FIXTURES," by H. M. Adams, Automation Specialist, Chrysler Corporation.

3:30 P.M. THE WHAT AND HOW OF SURFACE FINISH

- Room C Chairman: R. S. Morford, Tool Control Supt., Caterpillar Tractor Company
"A SURVEY OF SURFACE FINISH INSPECTION TECHNIQUES," by C. H. Good, Production Engineer, Micrometrical Manufacturing Company.
"SURFACE FINISH AND THE PRODUCTION ENGINEER," by Dr. C. R. Lewis and A. L. Thomson, Chrysler Corporation.

8:00 P.M. AUTOMATION—YOU CAN AFFORD IT!

- Room A Chairman: Mel Burdett, Machine & Tool Buyer, Caterpillar Tractor Company
"AUTOMATION FOR THE BIG PRODUCTION SHOP," by Ralph E. Cross, Executive Vice President, The Cross Company.
"AUTOMATED ELECTRONICS," by J. B. Cunningham, Manufacturing Specialist, Convair Division—General Dynamics Corporation.

MANAGEMENT DAY

THURSDAY, MARCH 22

9:30 A.M. FLUID POWER TODAY

- Room B [The National Fluid Power Association will cosponsor a conference on fluid power for the tool engineer.]
Chairman: NFPA Representative
Papers to be announced.



Maytag switches to STANICOOl HD Soluble Oil... makes two-way saving

- 1 Cost of soluble oil reduced
- 2 Soluble oil consumption cut two-thirds

A check of manufacturing costs on the inner tubs of Maytag's fine automatic washers, disclosed that the cost of soluble oil per unit produced was too high. Standard Oil Lubrication specialist J. I. Nelson, working with plant management suggested a switch to STANICOOl HD Soluble Oil.

The switch was made and Maytag received the first part of its two-way saving: the cost of soluble oil per gallon was reduced. Then it was found that the same high quality product could be turned out, without loss of tool life, while spraying only every third tub. Formerly each tub was sprayed with soluble oil before processing. With STANICOOl HD, soluble oil consumption was reduced two thirds. And thus, Maytag received part two of its two-way saving.

Perhaps STANICOOl HD Soluble Oil can help you make similar savings. Find out. Call your nearby Standard Oil office in any of the Midwest or Rocky Mountain states. Or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.



STANDARD OIL COMPANY
(Indiana)



Dwight Norton (right) a Maytag plant foreman inspects automatic washer inner tub with Jesse I. Nelson, Standard Oil lubrication specialist. Jesse Nelson is well qualified to provide lubrication technical service. He has a B.S. degree in engineering from the University of Iowa and has completed the Standard Oil Sales Engineering School. Jesse has been helping customers with lubrication problems for more than three years. Customers find his experience and training pay off for them.

ASTE Technical Program...

10:30 A.M. METAL CUTTING RESEARCH APPLIED

- Room C Chairman: Carl J. Oxford, Jr., Research Engineer, National Twist Drill & Tool Company
"CRATER WEAR OF CUTTING TOOLS," by Prof. K. J. Trigger and Prof. B. T. Chao,
Dept. of Mechanical Engineering, University of Illinois.
"SOME APPLICATIONS OF RESEARCH FINDINGS TO SHOP PROBLEMS," by Prof.
L. V. Colwell, Dept. of Production Engrg., University of Michigan.

1:30 P.M. TRAINING AND DEVELOPMENT OF TOOL ENGINEERS

- Room A Chairman: Prof. O. D. Lascoe, Dept. of Industrial Engineering, Purdue University
"THE TRAINING AND DEVELOPMENT OF TOOL ENGINEERS," by Prof. O. W.
Boston, Dept. of Production Engineering, University of Michigan.
"INDUSTRY LOOKS AT THE ENGINEERING SHORTAGE," by T. C. Gleason, Asst.
Chief Engineer, Chrysler Corporation Laboratories.

3:30 P.M. COST REDUCTION THROUGH PRODUCT AND

TOOL MAINTENANCE ANALYSIS

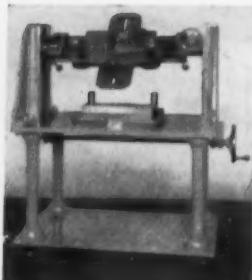
- Room B Chairman: Fred R. Swanson, Chief Commercial Engineering, Sundstrand Machine
Tool Company.
"PRODUCT CHANGES IMPROVE MANUFACTURABILITY," by L. D. Miles, General
Electric Company.
"CONTROL OF TOOL COSTS LOWERS PRODUCTION COSTS," by E. Griffiths, Director
of Expense Control Headquarters Mfg. Division, Westinghouse Electric Corporation.

TOOL ENGINEERING DAY

FRIDAY, MARCH 23

9:30 A.M. DESIGNING FOR TOMORROW'S COMPETITION

- Room A Chairman: P. F. Dirksen, Mechanical Engineer, Weaver Mfg. Company
"MEASURING PRODUCTIVITY IN TOOL DESIGN," by Prof. A. F. Gould, Dept. of
Industrial Engineering, Lehigh University.
"PLANNING FOR TOMORROW'S GAGING," by Lewis O. Heinold, Manager, Auto-
matic Control Engineering Dept., Federal Products Corporation.



HAUSER Die Handler

For tool rooms, inspection, press and try-out departments.

Mobile or stationary. 180 degrees rotation of punch. Locks in any position. 24" x 40" base table. Ball bearing construction.
Dealer inquiries invited.

WRITE FOR DETAILS

HAUSER MFG. CO. 234 MILL STREET ROCHESTER 14, N. Y.

**\$987 F.O.B.
FACTORY**

For more data circle 416 on Reader Service Card

FOR AUTOMATIC CYCLES IN
PRODUCTION MACHINES:

Ex-Cell-O Quill-Type Power Units



This special machine with automatic indexing fixture core-drills piston pin holes and drills angular oil holes. It uses six Ex-Cell-O Power Units (shown without belt guards) operated from a central push-button station.

Ex-Cell-O Hydraulic Power Units feed and rotate cutting tools in easily controlled automatic cycles. They actuate single tools or multiple spindle heads for such operations as drilling, reaming, counterboring and spot-facing. Hydraulic operation provides smooth, powerful movements.

A machine utilizing Ex-Cell-O Power Units can be very simple, with manual loading and clamping. Or it can be designed with work handling equipment for automation . . .

For complete information, including specifications and installation drawings, ask your Ex-Cell-O Representative or write Ex-Cell-O in Detroit.

EX-CELL-O CORPORATION DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • GRINDING SPINDLES • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

For more data circle 417 on Reader Service Card

55-14

March, 1956

modern machine shop 149

ASTE Technical Program...

10:30 A.M. STANDARDS AND THE TOOL ENGINEER

- Room B Chairman: Cyril Ainsworth, Technical Director, American Standards Association
"ASTE-RECOMMENDED CARBIDE TOOL TIP STANDARDS," by W. H. Seacord, Supervisor of Mfg. Standards Research International Harvester Company-Mfg. Research Dept.
"THE NEED FOR TOOL STEEL STANDARDS," by Dr. G. A. Roberts, Vice President—Technology, Vanadium Alloys Steel Company.

1:30 P.M. TOOLING THE WORLD'S LARGEST PRESSES

- Room C "TOOLING PROBLEMS FOR UTILIZATION OF LARGE HYDRAULIC PRESSES," by A. E. Favre, Chief Prod. Engr., Cleveland Forge Plant, Aluminum Company of America.
"TOOL PROBLEMS PECULIAR TO THE HEAVY PRESS EXTRUSION INDUSTRY," by H. J. Ross, Production Mgr., Heavy Press Extrusion Plant, Kaiser Aluminum & Chemical Corporation.

2:30 P.M. LUBRICATION FOR THE TOOL ENGINEER

- Room A Chairman: Wm. Kruck, Engineer, Metals Lubricants Company
"SOLUBLE OILS AND THE TOOL ENGINEER," by Dr. R. K. Gould and R. C. Givens, Technical Service Division, Research & Technical Department, The Texas Co.
"ROLE OF CUTTING FLUIDS IN MACHINERY OPERATIONS," by Dr. M. E. Merchant, Asst. Director Research, Cincinnati Milling Machine Company.

POWER ROLL
NEW MEDELTON AUTOMATIC COIL CRADLE
SAVES LABOR! SAVES MONEY!
DESIGNED FOR GREATER EFFICIENCY AND
SAFETY IN HANDLING COIL STOCK

- Roll on your coil and it's ready to go.
- Screw operated separator plate.
- No lifting, no pull, no accidents.
- Slack loop permits faster feeding.
- No drag on feed or dies. Eliminates pull, operator fatigue and spoilage.
- Can now be equipped with Pinch Roll attachment.

Phone or write for new folder • Dealer inquiries invited.

WM. HALPERN & CO., Inc.
MACHINE TOOLS
100 STEVENS AVE., MOUNT VERNON, N. Y.

R 104
1000 lbs. Cap.
R 204
2200 lbs. Cap.

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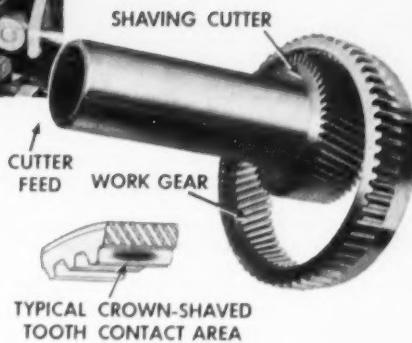
**50% Reduction in Shaving Time
of CROWNED
INTERNAL GEARS
by NEW
PLUNGE-CUT
PROCESS**



This typical internal automatic transmission gear is crown-shaved in 24 seconds machine time with the tooling shown.

Amount and position of crown for any specific work unit is optional.

The Plunge-Cut Process is equally applicable to straight-tooth gears and with the same economy in shaving time.



If you are mass-producing internal gears, write for Bulletin 555-6 on Internal Gear Shaving Machine, Model GCR



7342

NATIONAL BROACH & MACHINE CO.

5600 ST. JEAN DETROIT 13, MICHIGAN

WORLD'S LARGEST PRODUCER OF GEAR SHAVING EQUIPMENT

For more data circle 419 on Reader Service Card

ASSTEC Plant Visits

Buses for all morning tours depart promptly at 8:30 A.M. from the Conrad Hilton Hotel and terminate at the International Amphitheatre. Buses for all afternoon tours depart promptly at 1:15 P.M. from the International Amphitheatre and terminate at the Conrad Hilton Hotel. Round trip transportation is \$1.50 per tour.

MONDAY, MARCH 19

1:15 P.M. MOTOROLA, INC.

Tour No. 1 Visitors will see a modern plant with one of the newest and most complete conveyor systems in the country. Final assembly of all types of electronic parts, including color TV, will be seen. LIMITED TO 200 VISITORS.

TUESDAY, MARCH 20

8:30 A.M. U. S. STEEL CORPORATION (South Works)

Tour No. 2 Tour will include the open hearth operation, Bessemers, blast furnaces and rolling in the beam mill and the alloy bar mill. LIMITED TO 200 VISITORS. NO CAMERAS PERMITTED.

8:30 A.M. ARMOUR RESEARCH FOUNDATION

Tour No. 3 Visitors will see research experiments on abrasion at high temperatures, lubrication chemistry, hot box problem for railroad bearings, development of new alloys, and research of mechanisms of vibration tools. LIMITED TO 50 VISITORS. NON-U. S. CITIZENS MUST REGISTER IN ADVANCE WITH THE FOUNDATION.

1:15 P.M. ARMOUR RESEARCH FOUNDATION

Tour No. 4 (Repeat of Tour No. 3)

1:15 P.M. SKIL CORPORATION

Tour No. 5 Boring aluminum, polishing, and plating are all done in the plant. Heat treating and hobbing from straight rack gears to spiral bevel will also be shown. A new automatic washer for die cast materials is one of the features. Also, a complete punch press operation up to 150 ton capacity will be shown. LIMITED TO 90 VISITORS.

WEDNESDAY, MARCH 21

8:30 A.M. FORD MOTOR COMPANY

(Aircraft Engine Division)

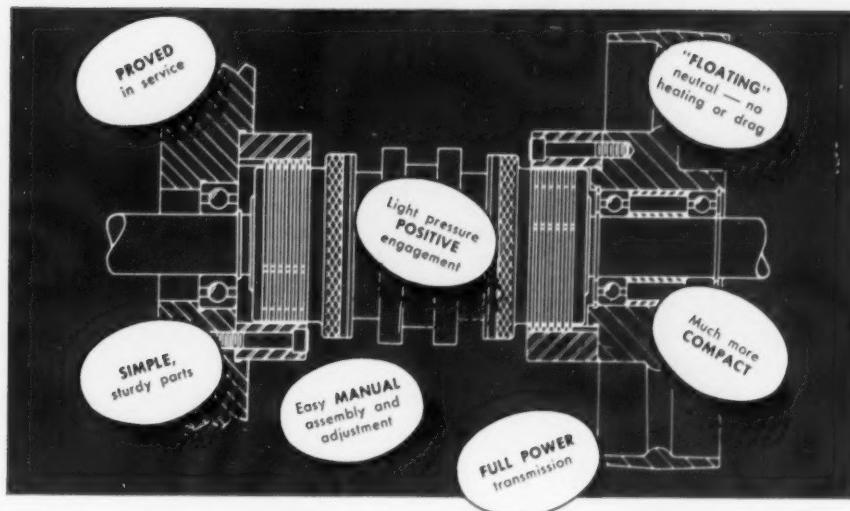
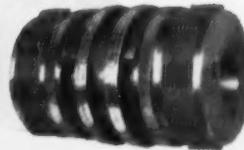
Tour No. 6 Largest manufacturing building under one roof—84 acres presently employing 10,000 persons. Visitors will see machining of most parts of the J-56 and J-57 engines, including drilling, tapping, broaching, and grinding of "hot" parts. LIMITED TO 100 VISITORS. NON-U. S. CITIZENS WILL BE REQUIRED TO CLEAR WITH THE AIR FORCE AT THE PLANT.

ASSURE YOUR PRODUCT THE
PROVED SUPERIORITY OF A

MAXITORQ

floating disc

CLUTCH



The line drawing shows typical application of a double Maxitorq Floating Disc Clutch, arranged for both drive and brake, with ring-type driving cups.

Such installations have a well-proved record of efficiency and freedom from maintenance. Drive and brake engagement and disengagement are smooth and positive . . . without drag or heating . . . because exclusive MAXITORQ design assures that discs ride free in neutral.

MAXITORQ Floating Disc Clutches are available in a wide range of sizes and types . . . single, double, overload release . . . to meet specific installation demands. Our engineering department also stands ready to help you solve special drive problems. Write or phone Dept. MM-3. The Carlyle Johnson Machine Company, Manchester, Conn.



Let's talk **MAXITORQ**

For more data circle 420 on Reader Service Card

ASTE Plant Visits...

8:30 A.M. SCULLY-JONES & COMPANY

Tour
No. 7

Visitors will see engineering department, then flow of work from steel storage completely through final assembly. During the process the following operations will be seen: automatic turning, all phases of grinding, drilling, tapping, and milling; also, induction heat treating. LIMITED TO 50 VISITORS. NO CAMERAS PERMITTED.

1:15 P.M. SCULLY-JONES & COMPANY

Tour
No. 8

[Repeat of Tour No. 7]

1:15 P.M. HOTPOINT COMPANY

Tour
No. 9

Visitors will see the range, refrigerator, and laundry machine sections. Top output for any appliance is one every twenty seconds. LIMITED TO 200 VISITORS. NON-U. S. CITIZENS REQUIRE STATE DEPARTMENT CLEARANCE.

THURSDAY, MARCH 22

8:30 A.M. KROPP FORGE COMPANY

Tour
No. 10

In the country's largest job forging shop which recently completed the world's largest hammer installation, visitors will see the following: research metallurgical laboratory; flat die, drop forge and upset forging operations; modern heat treating equipment; and final inspection. LIMITED TO 125 VISITORS. NO CAMERAS PERMITTED.

1:15 P.M. INTERNATIONAL HARVESTER

Tour
No. 11

(Melrose Park Works)
Visitors will see all types of machining on six different diesel engines. This includes automation equipment for all types of operations. LIMITED TO 50 VISITORS. U. S. CITIZENS ONLY. NO CAMERAS PERMITTED.

1:15 P.M. ELECTROMOTIVE DIVISION

Tour
No. 12

(General Motors Corporation)
Visitors will see manufacturing operations at the LaGrange Plant, including machining of component parts for diesel engines, electrical and diesel sub-assembly divisions and the final assembly of diesel electric locomotives with emphasis on interesting applications of tooling. LIMITED TO 200 VISITORS.

*You Need an Extra Hand Now
to Speed Up Production!*

HEIMANN TRANSFER SCREW SETS



IN 11 SIZES—No. 6 to 1"
N.C. in all S.A.E. sizes.

Here is the faster, more precise way of transferring open and blind screw holes—make savings in "wage-dollars-per hour" of your expensive hands on every job. A die-and-tool maker's tool with many other applications for die makers and machinists. A set of 6 Hardened Screws nested in combination holder and wrench—no other tools needed. Get more work now—save money too!

HEIMANN MFG. CO. • URBANA, OHIO

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LOOK TO

American FOR LEADERSHIP



IN SERVICE, RELIABILITY and QUALITY

SEE...

American's
EXHIBIT BOOTH
FEATURING ADVANCED
PLASTIC TOOLING
BOOTH #428
MARCH INDUSTRIAL EXPOSITION
March 19-23, 1956
Chicago, Illinois



To be sure you get all of these American standard features use American drill jig bushings.

Double ground lead for easy pressing into the jig.
Radius into the hole — to prevent tool hang-up, wear and breakage.

Two way undercut under the head to insure squareness to the jig.

100% concentricity inspection.
Internal ground holes to insure straightness.

Original 3-D ordering method eliminating confusing code numbers.

Patented bushings for plastic tooling.
Complete local stocks.
Send for free catalog showing complete line.

American
DRILL BUSHING CO.

5107 PACIFIC BOULEVARD, LOS ANGELES 58, CALIF.

For more data circle 422 on Reader Service Card

ASTE Plant Visits...

1:15 P.M. SEARS, ROEBUCK AND COMPANY

(Merchandising, Testing and Development Labs)

Tour
No. 13

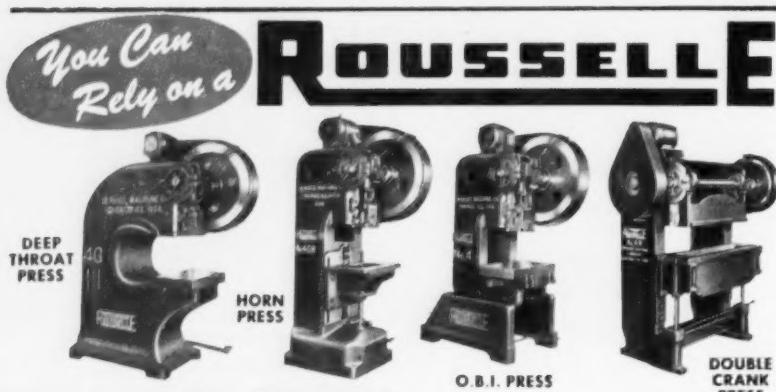
Visitors will see products, purchased by Sears, tested completely. This program includes testing and tearing down major appliances, machinery and numerous mechanical devices. In addition, most items competitive to those which they buy are rigidly checked. All makes of tools are constantly being tested for performance, and so on. LIMITED TO 50 VISITORS.

FRIDAY, MARCH 23

8:30 A.M. VERSO ALLSTEEL PRESS CORPORATION

Tour
No. 14

Visitors will see under one roof, 500,000 sq. ft. of one of the most modern press and tooling manufacturing facilities in the world. Burning and welding operations, milling, boring, planing, and gear cutting operations required to produce presses ranging from 60 to 28,000 tons will be shown. Also to be seen in operation will be a new research and development center, currently developing new processes in the field of cold extrusion. LIMITED TO 200 VISITORS.



THESE 40-TON PRESSES

take job after job in stride and give you top speed and uniform output on a variety of work. They stress simplicity in every detail to achieve quicker set-ups, easier changeovers and simpler operation. All are extra rugged, high precision units, made to withstand hard usage and assure long, satisfactory service. They are very moderately priced.

Manufacturers of Rouselle Presses

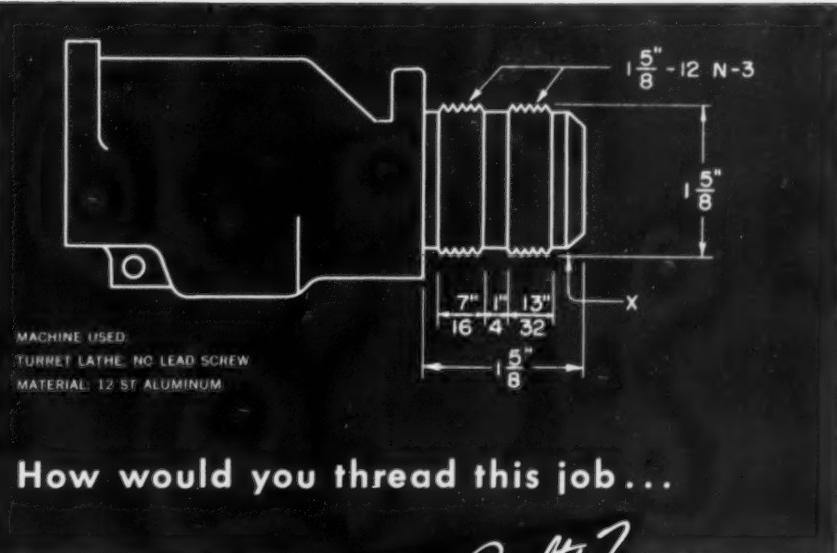
Significant savings may result if you let our engineering staff assist you. There is no obligation.

* Rouselle Presses are sold exclusively through leading machinery dealers.

* Choice of 25 models in 5 to 40-ton sizes.

SERVICE MACHINE CO. 2310 West 78th Street • Chicago 20, Ill.

For more data circle 423 on Reader Service Card



How would you thread this job...

to Guarantee Results?



TANGENT CHASER TYPES

Stationary and Revolving #4 to 2"



RADIAL CHASER TYPES

#8 to 4 1/4"

FOR BROWN & SHARPE AUTOMATICS

and small turret lathes #0 to 1 3/4"



Ask, too, for a showing of the movie "Die Head Threading"



THE PROBLEM: Produce Class III threads with exceptionally fine finish. Chasers must not score diameter "X" when fed onto the work.

THE SOLUTION: Using a J & L Tangent Die Head, this manufacturer was able to set *all four* chasers accurately to the same point height of .018" ahead of center.

It takes J & L accuracy with "no approximations" to guarantee Class III results, not sometimes, but every time. And chaser resharpening is controlled too.

THE RESULTS: Exceptionally fine finish. The $\frac{1}{4}$ " undercut between threads is turned after threading. More than 3,600 pieces are threaded to Class III tolerances without resharpening chasers.

Send for Data Folder #505.

JONES & LAMSON

JONES & LAMSON MACHINE CO., 521 Clinton St., Dept. 710, Springfield, Vt., U.S.A.



Class III Guaranteed —
Not Sometimes, but Everytime!

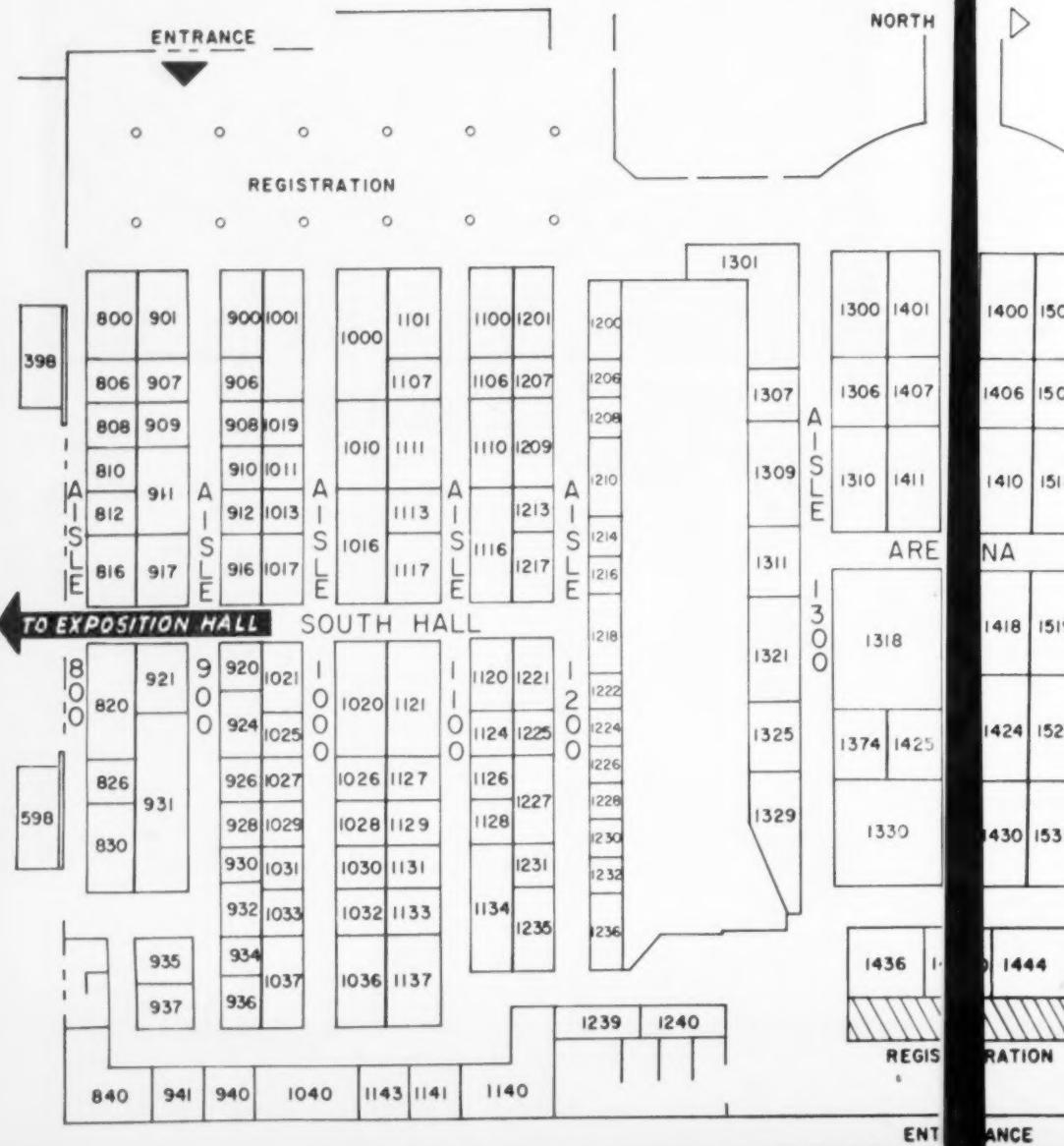
THREAD TOOL DIV

For more data circle #24 on Reader Service Card



Floor Plans of International

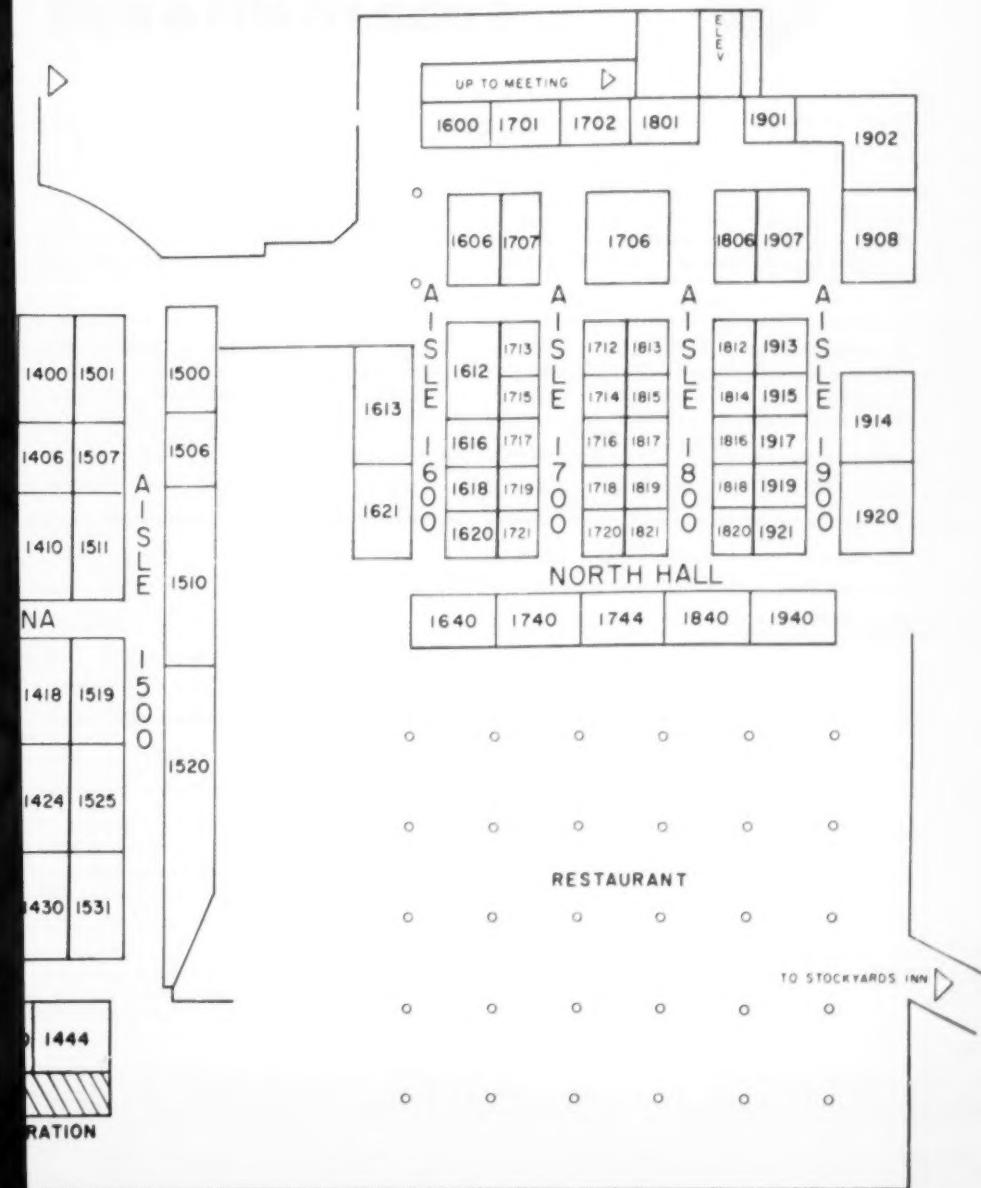
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Arena Main Floor Amphitheatre



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Floor Plans of International

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|-----------|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 100 | 101 | | | 118 | 122 | 126 | | 130 | 136 | 138 | 140 | 142 | 144 | | 146 | | 152 | |
| AISLE 100 | | | | | | | | | | | | | | | | | | | |
| 200 | 105 | 109 | | | 113 | 117 | 121 | 125 | | 129 | 135 | 141 | 145 | 151 | | | | 153 | |
| | 204 | 208 | | | 212 | 216 | 218 | 224 | | 228 | 234 | 236 | 238 | 240 | 244 | 246 | 250 | | 252 |
| AISLE 200 | | | | | | | | | | | | | | | | | | | |
| 202 | 205 | 209 | 213 | 215 | 219 | 225 | | | 229 | 233 | 237 | 241 | 245 | 251 | | | | 253 | |
| 203 | 304 | 308 | 312 | 314 | 318 | 324 | | | 328 | 332 | 336 | 338 | 342 | 350 | | | | 352 | |
| 300 | AISLE 300 | | | | | | | | | | | | | | | | | | |
| 301 | 305 | | 317 | 321 | 325 | | | | 329 | | 345 | | 351 | | | | | | |
| 302 | 404 | 412 | 416 | 420 | 424 | | | | 428 | | 440 | 444 | 450 | | | | | | |
| 303 | AISLE 400 | | | | | | | | | | | | | | | | | | |
| 401 | EXPOSITION | | | | | | | | | | | | | | | | | | |
| 402 | 405 | 415 | 421 | 425 | | | | | 429 | | 445 | 451 | | | | | | | |
| 500 | AISLE 500 | | | | | | | | 528 | | 540 | 544 | 550 | | | | | | |
| 501 | 504 | | 520 | 524 | | | | | | | | | | | | | | | |
| 502 | 505 | 509 | 515 | 519 | 525 | | | | 529 | 533 | 537 | 541 | 545 | 551 | | | | | |
| 503 | 604 | 608 | 614 | 618 | 624 | | | | 628 | 632 | 636 | 638 | 642 | 646 | 650 | | | | |
| 600 | 605 | 613 | 617 | 621 | 625 | | | | 629 | 631 | 633 | 635 | 637 | 639 | 641 | 645 | 651 | | |
| | 704 | 708 | 712 | 714 | 716 | 720 | 724 | | 728 | 730 | 734 | 736 | 738 | 740 | 744 | 750 | | | |
| AISLE 600 | | | | | | | | | | | | | | | | | | | |
| | 707 | 709 | 711 | 717 | | | | | 721 | 725 | 729 | 731 | 733 | 735 | 737 | 739 | 741 | 749 | |
| AISLE 700 | | | | | | | | | | | | | | | | | | | |

Exposition Hall Amphitheatre



| | | | | | | | | | | | | |
|-----------|-----|-----|-----|-----|-----------|-----|-----|-----------|-----------|---------------------|--------------|-------|
| 140 | 152 | 158 | 162 | 166 | 170 | 174 | 178 | 184 | AISLE 100 | | NORTH ▷ | |
| 153 | 157 | 159 | 161 | 163 | 165 | 167 | 169 | 175 | AISLE 200 | | | |
| 252 | 256 | 258 | 260 | 262 | 264 | 266 | 268 | 274 | AISLE 300 | | | |
| 253 | 257 | 261 | 263 | 267 | 275 | | 279 | 285 | 289 | 297 | | |
| 352 | 356 | 360 | 362 | 366 | 374 | | 378 | 388 | 392 | 396 | | |
| 353 | | | 367 | 375 | 379 | | 389 | 393 | 397 | FROM SOUTH HALL | | |
| 452 | | | 466 | 474 | 478 | | 488 | 496 | | | | |
| HALL | | | | | AISLE 400 | 479 | | | | | | |
| 453 | | | 461 | 467 | 475 | 578 | | 588 | 596 | | | |
| 552 | | | 560 | 562 | 566 | 574 | | 579 | 589 | 597 | | |
| 553 | | | 557 | 561 | 563 | 567 | 571 | 575 | 678 | | 696 | |
| 652 | | | 660 | 662 | 666 | 670 | 674 | AISLE 500 | | MODERN MACHINE SHOP | | |
| 653 | | | 657 | 659 | 661 | 665 | 669 | 675 | 679 | 685 | 689 | 693 |
| 752 | | | 756 | 758 | 760 | 764 | 768 | 774 | 778 | 784 | 788 | 792 |
| AISLE 600 | | | | | AISLE 700 | 791 | | | | | REFRESHMENTS | |
| 755 | | | | | 761 | 763 | 767 | 773 | 777 | 779 | 785 | WOMEN |
| | | | | | | | | | | | | MEN |

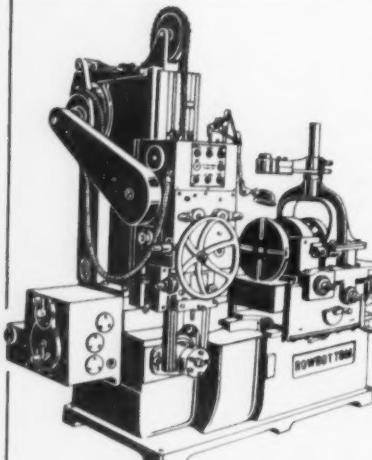
List of Exhibitors

| Company Name | Booth No. | Company Name | Booth No. |
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| - A - | | | |
| A A Gage Co. | 121 | Bakelite Co. | 397 |
| Ace Drill Bushing Co. | 175 | Balance Engineering Co. | 1111 |
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| Acme Tool Co. | 402 | Barker Engineering Co. | 731 |
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| | | General Industrial Diamond Co. | 810 |

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| Grovco-Nelson Co. | 1226 | Harrison & Sons, T. S. | 415 |
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| Graymills Corp. | 360 | House Engineering | 246 |
| Greist Mfg. Co. | 1721 | Haynes Stellite Co. | 931 |
| Griswold Mfg. Co., F. T. | 236 | Heintz Mfg. Co. | 129 |
| Grobet File Co. | 657 | Heinrich Tools, Inc. | 788 |
| Guthery Machine Tool Corp. | 420 | Heller Tool Co. | 256 |
| - H - | | | |
| H & H Research | 402 | Hillyer Instrument Co. | 1200 |
| Hammond Machinery Builders | 675 | Hirschmann Co., Carl | 101 |
| Handy & Harman | 275 | Hofmann Engineering Co. | 1714 |
| Hanna Engineering Works | 366 | Hoglund Engineering Co. | 205 |
| Hannifin Corp. | 158 | Hole Engineering Service | 185 |
| Hansford Mfg. Corp. | 1232 | Horton Chuck | 764 |
| Hanson-Whitney Co. | 163 | Howe & Fant, Inc. | 575 |
| | | Hudson Automatic Machine & Tool | 940 |
| | | Hunt & Son, C. B. | 141 |



Rowbottom for Cams
 ... for
 fast, low cost production of all types

Take advantage of Rowbottom's long, specialized experience in building cam millers and cam grinders . . . machines designed for modern, fast production of box, barrel and face cams in sizes up to 32" O.D. • Should it be more practical, call on Rowbottom to act as your cam-making department, producing your requirements exactly to your specifications, promptly, economically. Rowbottom offers a complete service including design of cams and cams ground after hardening . . . in all sizes, types and quantities.




Typical cams produced on Rowbottom machines.

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P. O. BOX No. 4097, WATERBURY 14, CONNECTICUT

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in this **NEW**
compact
carrying case

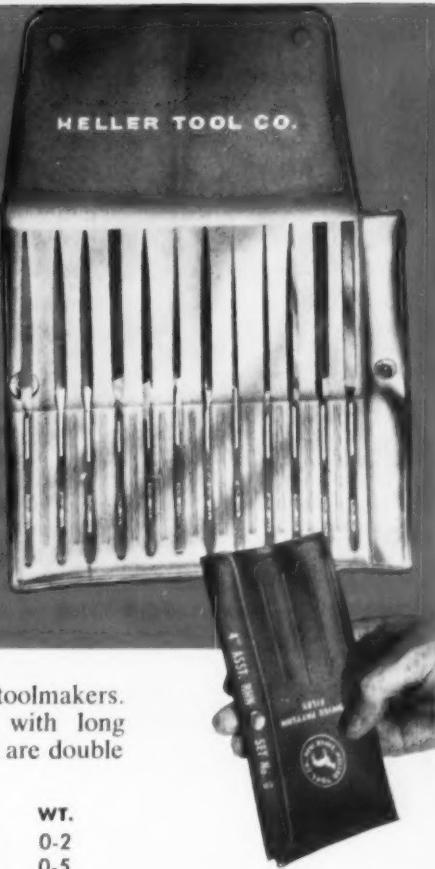
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American-Swiss®
ROUND HANDLE
**NEEDLE
FILES**

For die makers and other fine toolmakers.
Twelve different shapes, each with long
knurled handle for firm grip. All are double
cut.

| SIZE | CUT | WT. |
|------|------------|-----|
| 4" | 0, 2, 4, 6 | 0-2 |
| 5½" | 0, 2, 4, 6 | 0-5 |
| 6¼" | 0, 2, 4, 6 | 0-8 |

Square Handle Needle Files (Escapement) 5½" size—
cuts 0-2-4-6—also furnished in this handy plastic kit



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**LIVE CENTER
ACTION WITH
DEAD CENTER
ACCURACY**

USE



**ANTI-SCORING
LUBRICANTS**

**PROVE IT TO
YOURSELF IN
YOUR OWN PLANT FOR ONE
DOLLAR AND THIS COUPON!**

Free-running on dead centers—with COMPLETE protection. CMD Lubricants are CONCENTRATED, form a "tough" film—absolutely NO GALLING or SEIZING—under the heaviest load. STABILIZED for added "oiliness" giving longer, smoother runs without slip-stick action. It all adds up to LIVE CENTER ACTION with DEAD CENTER PRECISION. The bigger the job, the better you'll like it.

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TWO FOUR OZ. TUBES \$1.00**

Send me my order of CMD right away!
Bill me Bill my company

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Company Name_____

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City_____ State_____

Chicago Manufacturing and Distributing Co.
1910 West 46th St., Chicago 9, Illinois

**CHICAGO MANUFACTURING
AND DISTRIBUTING CO.**

For more data circle 427 on Reader Service Card

166 modern machine shop



List of Exhibitors . . .

| Company Name | Booth No. |
|--------------|-----------|
|--------------|-----------|

| | |
|----------------------------|------|
| Huron Machine Products Co. | 1029 |
| Hydro-Line Mfg. Co. | 321 |

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| | |
|--------------------------------------|------|
| Ideal Industries | 659 |
| Illinois Metal Products | 1712 |
| Index Machine Co. | 791 |
| Industrial Diamond Association | 520 |
| Industrial Filtration Co. | 567 |
| Industrial Tectonics, Inc. | 1100 |
| Ingersoll-Rand Co. | 345 |
| Inspection Devices Co. | 1231 |
| International Research & Development | 1026 |

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| | |
|------------------------------|------|
| Jarvis Corp. | 1401 |
| Jergens Tool Specialty Co. | 401 |
| Jerico | 240 |
| Jerpak Bayless Co. | 1031 |
| Jig Bushing Co. | 1101 |
| Jiffy Disintegrators | 200 |
| Johnson Gage Co. | 926 |
| Johansson Gage Co., C. E. | 1217 |
| Johansson Co., I. O. | 1719 |
| Jones & Lamson Machine Co. | 497 |
| Jones & Laughlin Steel Corp. | 1606 |
| Jones & Shipman, Ltd. | 425 |

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| | |
|------------------------------|------|
| K-P National Sales | 1717 |
| Karniotis Precision Products | 1033 |
| Kaydon Engineering Corp. | 268 |
| Kalamazoo Tank & Silo Co. | 639 |
| Kenco Mfg. Co. | 618 |
| Kenhos Corp. | 1140 |
| Kennametal Inc. | 475 |
| Keuffel & Esser | 524 |
| King Punch Co. | 712 |
| Koebel Diamond Tool Co. | 209 |
| Kolcast Industries | 1110 |

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| | |
|---------------------|-----|
| Lamina Dies & Tools | 562 |
| Landis Machine Co. | 578 |
| Lapeer Mfg. Co. | 553 |

March, 1956

modern MACHINES demand **MODERN** TOOLING!

solid
carbide

Jarvis **SOLID CARBIDE GIVES
MAXIMUM EFFICIENCY AND ECONOMY!**

Forward-thinking management demands a tool in step with the times—a tool that delivers accuracy with SPEED!—and pays for itself by producing more for longer periods. That's why the big swing is to Jarvis carbide tools!

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For more data circle 428 on Reader Service Card

List of Exhibitors . . .

| Company Name | Booth No. | Company Name | Booth No. |
|------------------------------------|-----------|-------------------------------------|-----------|
| Latrobe Steel Co. | 451 | M. B. I. Export & Import, Ltd. | 563 |
| Le Count Tool Works | 1107 | Mac-It Screw Div. | 906 |
| Lee & Sons Co., K. O. | 187 | Madison Mfg. Co. | 1209 |
| Lees-Bradner Co. | 424 | Magnaflux Corp. | 820 |
| Lempco Industrial, Inc. | 519 | Mall Tool Co. | 738 |
| Lehmann Boring Tool Co. | 213 | Manco Mfg. Co. | 708 |
| Lenz Co. | 1702 | Marathon Die Set | 1821 |
| Lindberg Engineering Co. | 1201 | Martin Engineering Co. | 761 |
| Linde Air Products Co. | 931 | Marvel Engineering Co. | 1028 |
| Littell Machine Co., F. J. | 589 | Maserati Corp. of America | 1806 |
| Lodding Inc. | 735 | Master Chemical Corp. | 1133 |
| Logan Engineering Co. | 900 | Master Pneumatic Tool Co. | 608 |
| Logansport Machine Co. | 245 | Matthews & Co., Jas. H. | 662 |
| Lovejoy Tool Co. | 184 | Mayline Co. Inc. | 1036 |
| Lufkin Rule Co. | 598 | Mead Specialties Co. | 215 |
| - M - | | | |
| Man-Au-Cycle Corp. of America | 614 | Melard Mfg. Corp. | 1009 |
| McCrosky Tool Corp. | 1117 | Merrill Engineering Labs. | 125 |
| M-B Products | 557 | Metal Carbides Corp. | 1300 |
| | | Metal Cutting Tools, Inc. | 1143 |

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Leeds & Northrup Company uses the MAGNI-FOCUSER — the needle sharp 3-D binocular magnifier — to inspect carbon detectors for micro-carb control of carburizing. The MAGNI-FOCUSER reduces eye strain and avoids squinting. It leaves both hands free to work. This means increased production, greater accuracy, fewer errors and accidents. Scores of industrial jobs are aided by the MAGNI-FOCUSER. It's light weight; can be worn with or without eye glasses. Normal vision resumed simply by raising the head. Speed your production by ordering now on 10-day trial basis without obligation. \$10.50. Or send for illustrated folder.

MAGNI-FOCUSER

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ACCEPTED!**

with high favor
by ALL who use it

always
in
BIG
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SURFACE GRINDERS



HYDRAULIC
OR
HAND FEED
AVAILABLE

BIG Machine Performance—small machine cost . . . Boyar-Schultz 6 x 12 Surface Grinder is designed for very close tolerance work and built with extra sturdiness to maintain that precision quality through a long life.

If your need is for extreme accuracy in a grinder that will accommodate as much as 80% of the work in the tool room . . . this is your best buy! We find this grinder is also used to great advantage in the production line. Write, wire or call us. We'll be glad to SHOW you what this fine grinder can do for you.

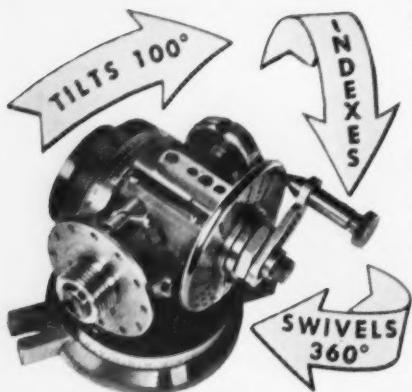
BOYAR-SCHULTZ CORPORATION

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For more data circle 430 on Reader Service Card

March, 1956

modern machine shop 169



FOR FASTER PRODUCTION

THE ELLIS DIVIDING HEAD

Although it is built to fine instrument standards, the ELLIS is a really rugged tool room or production tool that's designed for unusual versatility. Its universal motions—swiveling in two planes—will save time and increase profits and accuracy on your millers, grinders, drill presses and jig borers. It has 6½" swing, or 11" swing when used with riser blocks. Work may be held between centers, or in chucks or collets. To save rehandling of work, and to save money, investigate the ELLIS by writing for complete details!

N
NICHOLS MORRIS
M
CORPORATION

76-H MAMARONECK AVE.
WHITE PLAINS, N. Y.

For more data circle 431 on Reader Service Card

170 modern machine shop

List of Exhibitors . . .

| Company Name | Booth No. |
|------------------------------------|-----------|
| Metal Lubricants Co. | 666 |
| Metal Removal Co. | 617 |
| Micrometrical Mfg. Co. | 774 |
| Micro-Poise Engineering | 642 |
| Milford Rivet & Machine Co. | 453 |
| Miller Fluid Power Co. | 429 |
| Model Machine Co. | 739 |
| Modernair Corp. | 237 |
| Modern Devices | 533 |
| Modern Industrial Engineering Co. | 613 |
| Modern Machine Shop | 685 |
| Mohawk Tools, Inc. | 777 |
| Monray Corp. | 1033 |
| Moore Products Co. | 624 |
| Moore Special Tool Co. | 1430 |
| Morrison Engineering Co. | 332 |
| Morse Co., H. E. | 1010 |
| Match & Merryweather Machinery Co. | 1021 |
| Myer Corp. | 908 |

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| | |
|-------------------------------------|------|
| National Broach & Machine Co. | 816 |
| National Fluid Power Association | 238 |
| National Pneumatic Tool Co. | 244 |
| Neill & Co., James | 797 |
| Neise, Karl A. | 162 |
| Nelco Tool Co. | 778 |
| Nelson Stud Welding | 628 |
| New England Tool & Machine Co. | 461 |
| New Hermes Inc. | 166 |
| New York Belting & Packing Co. | 1307 |
| Nichols-Morris Corp. | 351 |
| Nicholson File Co. | 157 |
| Nikon Inc. | 1716 |
| Nilsson Gage Co. | 717 |
| Noble & Westbrook Mfg. Co. | 767 |
| Norgren Co., C. A. | 325 |
| North American Viking Drill Co. | 1101 |
| Northwestern Tool & Engineering Co. | 301 |
| Nupla Mfg. Co. | 398 |

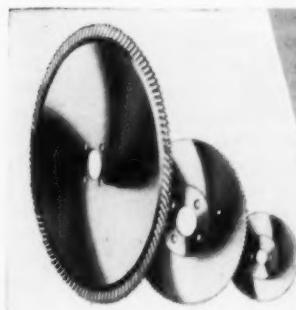
- O -

| | |
|-----------------------------------|------|
| O. K. Tool Co. | 633 |
| Oakite Products, Inc. | 1325 |
| O'Neil-Irwin Mfg. Co. | 1000 |
| Olsen Testing Machine Co., Tinius | 566 |
| Optical Gaging Products Co. | 917 |

March, 1956

Seeing is Saving at MOTCH & MERRYWEATHER'S booth 1021

A. S. T. E. EXPOSITION, CHICAGO



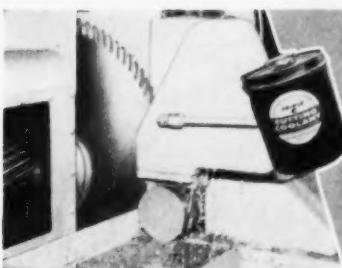
M & M Triple-Chip Saw Blades Save Waste in Metal Sawing

Complete line — segmental and solid — cut-off up to 108" dia., slitting down to 3" — for any machinable material, ferrous or non-ferrous, any size, any shape, any thickness. Less tooth strain, longer blade life, substantial savings in time and costs.



KROSLOK Milling Cutters Save Time in Precision Milling

Kroslok Face Milling Cutters and Shell End Mills cut any machinable material. Simplest design; only three members—body, blade, wedge. Serrations in body mate with cross serrations in blade. A profit-showing aid to accurate production milling.



Three Triple C Products Save Trouble in Tool Care

Triple C Grinding Coolant, Cutting Coolant and Machine Cleaner are Cool, Clear, Clean. Anti-rust, non-greasy, smokeless, odorless, foamless, non-flammable, non-clogging, safe for operators. A notable contribution to tool maintenance.



THE MOTCH & MERRYWEATHER MACHINERY CO.

Cutting Tool Manufacturing Division —

Stocking Dealers in All Principal Industrial Centers
1250 EAST 222nd STREET, CLEVELAND 17, OHIO

For more data circle 432 on Reader Service Card

List of Exhibitors . . .

| Company Name | Booth No. | Company Name | Booth No. |
|---|-----------|-------------------------------------|-----------|
| Orban Co., Kurt | 305 | Porter Precision Products | 216 |
| Ortman-Miller Machine Co. | 314 | Portomag Sales Inc. | 288 |
| Osborn Manufacturing Co. | 466 | Precise Products Corp. | 296 |
| Ozalid Division, General Film & Aniline Corp. | 1040 | Precision Detroit Co. | 1230 |
| - P - | | Precision Diamond Tool Co. | 318 |
| Pangborn Corp. | 749 | Precision Grinding Wheel | 267 |
| Patterson Machine Co. | 1812 | Precision Tool & Mfg. Co. | 806 |
| Pease Co., C. F. | 118 | Precision Welder & Flexopress Corp. | 725 |
| Pedrick Tool & Machine Co. | 356 | Procurier Safety Chuck Co. | 1701 |
| Perfex Gage & Tool Co. | 1818 | Production Devices Inc. | 795 |
| Perry Equipment & Engineering | 1210 | Production Equipment | 714 |
| Petz-Emery, Inc. | 910 | Production Machine Co. | 625 |
| Pfauter Machine Co. | 336 | Producto Machine Co. | 396 |
| Pines Engineering Co. | 197 | Punch Products Corp. | 191 |
| Pioneer Pump Div., Detroit Harvester Co. | 1406 | Putnam Tool Co. | 105 |
| Pioneer Tool Engineering, Inc. | 1235 | - R - | |
| Portage Double Quick Tool Co. | 669 | R and L Tools | 741 |
| | | Racine Hydraulics & Machinery | 229 |
| | | Rahn Granite Surface Plate Co. | 928 |

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HYDRAULIC PRESSES

for • ASSEMBLING
• BROACHING
• FORMING
• MOLDING
• STRAIGHTENING

Hydraulic presses made to conform to J.I.C. standards. Pictured at right is 15-ton hydraulic press.
Write for Catalog 554.

GREENERD ARBOR PRESSES

NASHUA • EST. 1883 • NEW HAMPSHIRE

For more data circle 433 on Reader Service Card

cut it with

stop



BAND SAW BLADES



ASK
YOUR
DISTRIBUTOR

THE CAPEWELL MANUFACTURING COMPANY
Hartford 2, Connecticut

Please send complete details on Capewell Band Saw Blades to:

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COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

**SEE CAPEWELL BOOTH NO. 1141
ASTE INDUSTRIAL EXPOSITION**

**HIGHER SPEEDS!
FASTER GRINDING!**

kipp

AIR GRINDERS

MODEL JA

50,000 R.P.M.

\$42.00

IN U.S.A.



Weight 12 ounces;
length 6½ inches;
chuck size ½ inch.
Wheelguard removed
for better illustration.

The RPM's stay up while
grinding . . . not only when the
grinder runs idle. That means
better work—longer wheel life.

High speed grinding with small
wheels was a Madison-Kipp de-
velopment of the late twenties.
It was born out of a pressing need
in our tool room. Because tool
room grinding problems are uni-
versal, we believe it will pay you
to utilize Kipp grinders in your
tool room as generally as we do
in our own.

kipp

MADISON-KIPP CORP.

For more data circle 435 on Reader Service Card

List of Exhibitors . . .

| Company Name | Booth No. |
|---|-----------|
| Raybestos Manhattan, Inc. | 161 |
| Ready Tool Co. | 1713 |
| Reliant Gage & Supply Co. | 1010 |
| Rezolin, Inc. | 388 |
| Rice Pump & Machine Co. | 264 |
| Richard Bros. Punch Div., Allied Products Corp. | 478 |
| Richards Co., J. A. | 721 |
| Rivett Lathe & Grinder, Inc. | 324 |
| Robbins Co., Omer E. | 416 |
| Robinson Aviation Inc. | 117 |
| Rockwell Mfg. Co. | 1410 |
| Rodgers Hydraulic Inc. | 126 |
| Ross Operating Valve Co. | 696 |
| Rotafeed Co. | 1620 |
| Roto-Mation Inc. | 724 |
| Rotor Tool Co. | 674 |
| Rouse & Co., H. B. | 1206 |
| Rowe Machinery & Mfg. Co. | 921 |
| Royal Oak Tool & Machine Co. | 278 |
| Rudd-Melikian Distributors | 711 |
| Russell, Holbrook & Henderson, Inc. | 353 |
| Ryerson & Son, Jos. T. | 1400 |

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| | |
|-----------------------------------|------|
| S-P Manufacturing Co. | 257 |
| S & S Machinery Co. | 614 |
| Sales Serv. Mach. Tool Co. | 393 |
| Salvo Tool & Engineering Co. | 1814 |
| Scharmann Machine | 1501 |
| Schauer Mfg. Corp. | 152 |
| Schmarje Tool & Engr. Co. | 1815 |
| Schmidt, Inc., Geo. T. | 1311 |
| Schrader's Son Div., A. | 525 |
| Schramm, Inc. | 600 |
| Scott Paper Co. | 228 |
| Scully-Jones & Co. | 488 |
| Segal Machine Co., Edward | 1813 |
| Seibert & Sons, Inc. | 1500 |
| Selas Corp. of America | 1218 |
| Sentry Co. | 284 |
| Service Diamond Tool | 501 |
| Service Machine Co. | 1506 |
| Severance Tool Industries | 289 |
| Sheldon Machine Co. | 1240 |
| Shell Oil Co. | 1306 |

SHELDON

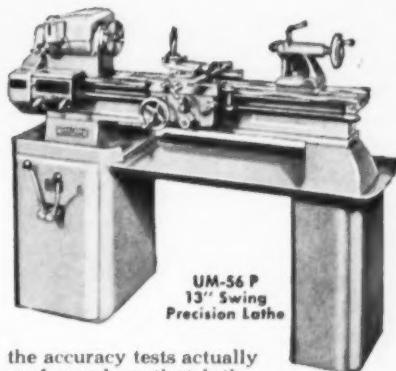
Precision
LATHES

for the size Lathes You Need Most

Sheldon lathes are built in the sizes you need most, for toolroom and production jobs. They are available with swings of 10", 11" and 13" . . . in varying bed lengths with 18" to 48" center distances . . . and . . . in your choice of pedestal, cabinet or bench mountings.

Powerful, all-V-belt, drive units—either the standard 8-speed (or 16-speed) E-drive; or the production favorite, a rapid, lever-shift U-drive. Where higher spindle speeds are desired, the standard E-drive can be built to provide speeds up to 2,000 r.p.m.

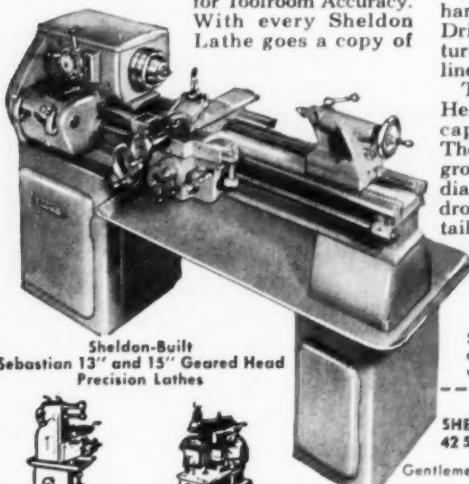
All Sheldon Lathes have handscraped, built-in precision. Each lathe is guaranteed to meet or surpass the American Standards for Toolroom Accuracy. With every Sheldon Lathe goes a copy of



the accuracy tests actually performed on that lathe.
(19 checks).

Important optional features include: hardened bed ways, L00 Long Taper Key Drive spindles, 4" D1 Camlock spindles, bed turrets, taper attachments and a complete line of toolroom and production accessories.

The new Sheldon-built Sebastian Geared Head Lathes have greatly increased work capacity and many advanced features. These include a wide, heavy, hardened and ground bed . . . easy shifting spindle speed dial . . . 60-pitch gear box . . . independent drop lever apron clutches . . . cam-action tailstock clamp . . . and, automatic lubrication in the headstock and apron with "1-shot" lubrication of carriage.



Sheldon-Built
Sebastian 13" and 15" Geared Head
Precision Lathes



SHELDON
Horizontal Milling Machine SHELDON
12" Shaper



Send in coupon or write for catalogs and names of nearest Sheldon and Sebastian Distributors where you can see these new lathes in operation.

SHELDON MACHINE CO., INC. 4250 North Knox Avenue, Chicago 41, Illinois

Gentlemen: Please send new catalogs describing:

- Sheldon 10", 11" or 13" Lathes
- Sebastian 13" and 15" Geared Head Lathes
- Horizontal Milling Machine Name of Local Dealer
- Sheldon 12" Shaper Have representative Call.

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Company Name

Street Address

Company Home

City

State

SHELDON MACHINE CO., Inc.

Builders of Sheldon Lathes, Milling Machines,
Shapers and Sebastian Lathes.

4250 North Knox Ave • Chicago 41, Ill.

See Us At Booth 1240, A.S.T.E. Show • International Amphitheatre, Chicago • March 19-23

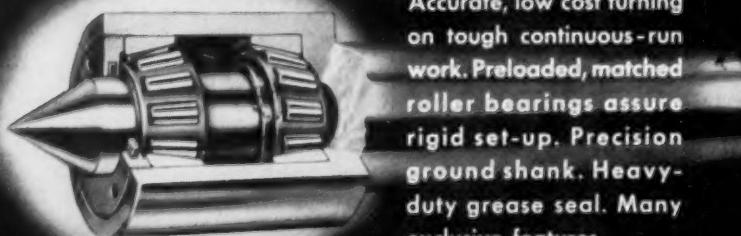
For more data circle 436 on Reader Service Card

List of Exhibitors . . .

| Company Name | Booth No. | Company Name | Booth No. |
|--|-----------|---|-----------|
| Sheppard, Stanley | 415 | Stupakoff Div., Carborundum Co. | 1309 |
| Siewek Tool Co. | 1425 | Sunnen Products Co. | 474 |
| Simonds Abrasive Co. | 1120 | Super Tool Co. | 122 |
| Simonds Saw & Steel Co. | 1120 | Superior Hone Corp. | 551 |
| Simplex Machine Tool Corp. | 1612 | Superior Pneumatic | 1224 |
| Size Control Co. | 930 | Superior Steel Products Corp. | 338 |
| Skinner Chuck Co. | 263 | Supreme Products, Inc. | 138 |
| Socony Mobil Oil Co. | 279 | Swanson Tool & Machine Products | 404 |
| Spiral Step Tool Co. | 109 | Swivelier Co. | 503 |
| Spitfire Tool Co. | 736 | Sykes Tool Corp. | 342 |
| Standard Electrical Tool Co. | 830 | Syntron Co. | 631 |
| Standard Gage Co. | 1016 | | |
| Standard Parts Co. | 1407 | | |
| Standard Pressed Steel Co. | 479 | | |
| Star Cutter Co. | 1329 | | |
| Starlite Industries | 300 | | |
| Starrett Co., L. S. | 1116 | | |
| Steel Products Engineering Co. | 660 | | |
| Stone Co., Herman | 142 | | |
| Stone Machinery Co. | 755 | | |
| | | - T - | |
| | | Taylor Devices | 292 |
| | | Taylor Dynamometer & Machine Co. | 779 |
| | | Texas Co. | 1236 |
| | | Thompson Co., Earl A. | 1444 |
| | | Thread-All Sales | 740 |
| | | Tocco Division, Ohio Crankshaft Co. | 440 |
| | | Tomco Products | 1213 |

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Falls ROTO CENTER



Accurate, low cost turning
on tough continuous-run
work. Preloaded, matched
roller bearings assure
rigid set-up. Precision
ground shank. Heavy-
duty grease seal. Many
exclusive features.

for
lathe and grinder
tail stocks



FREE BULLETIN 105

"What you should know
about LIVE CENTERS"

FALLS PRODUCTS, INC., 124 Genoa Street, GENOA, ILL., U.S.A.

For more data circle 437 on Reader Service Card



SIMONDS CROSS-ROLLED STEEL

Makes a Simonds hacksaw blade last longer!

*Look for... ask for
the blade with the "RED END"*

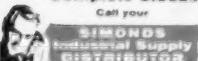
Test after test proves that Simonds "Red End" Hack Saw Blades last uniformly longer. One reason is Simonds cross-rolled steel . . . steel that has a more uniform grain structure for added toughness.

Another reason is Simonds own high quality steel — made especially for hack saw blade use.

Add to this Simonds improved method of tooth setting . . . and Simonds more uniform heat treating . . . and you've got the reasons why Simonds "Red End" Hack Saw Blades last longer, give more cuts per blade, cost less to operate.

Furnished in all standard lengths and tooth sizes for hand and power use with a choice of High Speed MOLYBDENUM; High Speed TUNGSTEN; WELD-EDGE (High Speed Shatterproof); and STANDARD STEEL (Hand Blades only).

For Fast Service
from
Complete Stocks
Call your



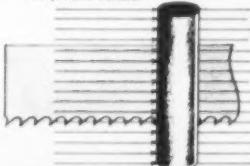
Factory Branches in Boston, Chicago, San Francisco and Portland, Oregon.
Canadian Factory in Montreal, Que., Canada. Simonds Steel Manufacturing Co., N. Y.
Heller Tool Co., New Haven, Conn.; Ohio, Simonds Alloys Co., Phila., Pa., and Atlanta, Ga., Canada.

For more data circle 438 on Reader Service Card

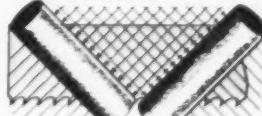
SIMONDS
SAW AND STEEL CO.

FITCHBURG, MASS.

ROLLED WIDTH-WISE — Blade tends to snap easily. Holes fracture.



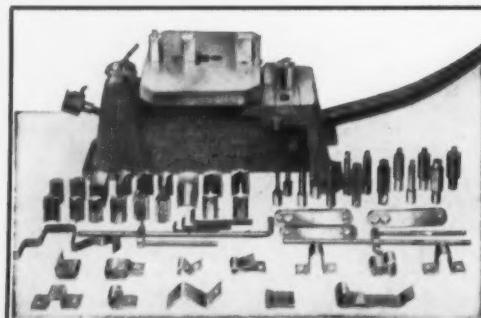
ROLLED LENGTHWISE — Teeth tend to strip out easily. Holes pull out.



SIMONDS CROSS-ROLLED — Provides toughest grain structure for longest life and resistance to breakage.

List of Exhibitors . . .

| Company Name | Booth No. | Company Name | Booth No. |
|------------------------------------|-----------|--|-----------|
| Tomkins-Johnson Co. | 225 | Victor Adding Machine | 679 |
| Tool Engineer | 840 | Vlier Engineering, Inc. | 1113 |
| Tooling & Production | 266 | Vulcan Tool Co. | 515 |
| Torrington Co. | 219 | | |
| Torit Mfg. Co. | 193 | | |
| Tree Tool & Die Works | 605 | - W - | |
| True-Trace Sales Corp. | 760 | Wadell Equipment Co. | 135 |
| Tubular Micrometer Co. | 924 | Waldes Kohinoor, Inc. | 251 |
| Tubular Rivet & Stud Co. | 670 | Wales-Strippit Corp. | 379 |
| Turnomat Co. | 1131 | Walker-Turner Div., Kearney & Trecker . | 1525 |
| Twentieth Century Mfg. Co. | 241 | Ward-Riddle Co. | 312 |
| | | Warner & Swasey Co. | 646 |
| | | Webber Gage Co. | 936 |
| | | Weldon Tool Co. | 629 |
| | | Wells Mfg. Corp. | 274 |
| | | Wesson Co. | 450 |
| | | Westplex Corp. | 1207 |
| | | West Point Mfg. Co. | 290 |
| | | Wetmore Reamer Co. | 1816 |
| | | Wharton & Wilcocks of America | 1705 |
| | | Wheelabrator Corp. | 146 |
| | | Whiton Machine Co. | 730 |
| | | Wickman Mfg. Co. | 597 |
| | | Willey's Carbide Tool Co. | 653 |
| | | Wilson Mechanical Instrument Div., American Chair & Cable | 909 |
| | | Wilton Tool Mfg. Co. | 1208 |
| | | Wisconsin Drill Head Co. | 502 |
| | | Woodworth Co., N. A. | 412 |
| | | - Z - | |
| | | Zagar Tool, Inc. | 179 |



Multiform BENDER CUTTER

Users report the Multiform Bender one of the handiest tools in the shop. No special tooling . . . Bends, Cuts, Punches, Flats, Rounds into Any Shape, Clamps, Brackets, Springs, Busbars, Wire Forms, Aircraft Work, Steel Rule Dies, Etc.

AIR OR HAND MODELS FOR UP TO
 $\frac{1}{4}$ " to 4" MATERIAL

Write for brochure which illustrates
and describes the four bender models.

J. A. RICHARDS CO.
Dept. 6-M Kalamazoo, Mich.

For more data circle 439 on Reader Service Card

*for Single or
Multiple
**PRECISION
TAPPING***

on your
**SPECIAL
MACHINES**

The WISCONSIN Model TU-415 Automatic Lead Screw Tapping Unit is a completely self-contained assembly designed especially for precision work on your special machines.

It may be mounted in any position and is permanently sealed against coolant entry.

Safety Features provide positive protection against spindle over-travel and tap end-thrust.

Setting up and Re-setting is done easily and quickly. Versatility is assured by ready changeability of spindle speed, spindle travel and thread pitch.

Controls are built in. A reversing motor controller and initiating switch or push button operate the unit. No relays are required.

Precision Construction permits precision tapping on a production basis. Simplicity of design assures ease of maintenance, accessibility of all parts.

See Our Exhibit, Booth No. 502, Tool Show, Chicago, March 19-23

WISCONSIN DRILL HEAD CO.

4983 N. 124th STREET • BUTLER, WISCONSIN

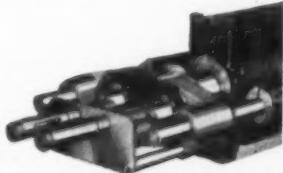
For more data circle 440 on Reader Service Card



WISCONSIN Model
TU-415 Automatic Lead
Screw Tapping Unit.



For Single Spindle Tapping,
the TU-415 is furnished with-
out quill flange and with ASA
1" bore, adjustable adapter
spindle.



For Multiple Spindle Tapping,
standard equipment includes
flanged quill and slotted spin-
dles for close-coupled multiple
spindle tapping heads.

On Display at ASTE

LATHES, DRILL PRESSES AND VERTICAL MILLING MACHINES

Clausing heavy-duty precision lathes, drill presses and vertical milling machines will be demonstrated in Booth No. 1418 by the Clausing Division, Atlas Press Co., 11-110 N. Pitcher St., Kalamazoo, Mich. New machines to be featured in the display include the 6300 Series 12-Inch Lathe and an 18-inch heavy-duty multiple-spindle drill press. The 6300 Series lathe features forged spindle with hardened, tapered, key-lock nose; precision Timken tapered roller bearings; 1-inch collet capacity; enclosed headstock, apron and quick-change gearbox (all with oil bath lubrication); outboard, underneath drive with dual A-belts driving the spindle pulley; tailstock with a No. 3 MT ram with tang socket for large tool capac-

ity; heavy-duty precision-ground bed; and pedestal steel-base mount.

With a drilling capacity of 1 inch in cast iron and $\frac{3}{4}$ inch in steel, the 18-inch heavy-duty multiple-spindle drill press features a large, heavy table with 84 x 22-inch working surface; No. 3 MT spindle and 6½-inch spindle travel; built-in switch; boned bearings for the quill; ball bearing equipped spindle; hand feed or gear driven power feed; and cast-iron pulleys. Other machine tools which will be on display include the 5300 Series 12-Inch Lathe with clutch and brake equipped countershaft and a 1-inch collet capacity, and the Clausing Vertical Milling Machine which machines at all angles with one work setup.

For more data circle 2 on Reader Service Card

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MACHINE TOOLS

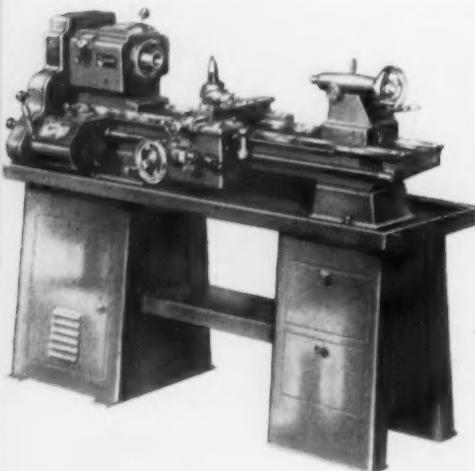
In Booth No. 305, Kurt Orban Co., Inc., 40 Exchange Place, Jersey City, N. J., will display the following machines in operation: Lindner Optical Jig Borer, Hurth Keyway and Slot Automatic Milling Machines, S & F Gear Testers, Trebel Dynamic Balancer, Schiess Vertical Turret Lathe and Pegard Boring and Milling Machines.

For more data circle 3 on Reader Service Card

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VERTICAL STATIC BALANCING MACHINES

In Booth No. 1111, Balance Engineering Co., 5030 W. Lake St., Chicago 44, Ill., will exhibit the Model 201-VL and the Model 201-VH Vertical Static Balancing Machines. The Model 201-



Clausing 6300 Series 12-Inch Lathe

Industrial Exposition

VL has a weight capacity ranging from 1 to 20 pounds and will handle diameters up to 20 inches. The Model 201-VH will accommodate from 5 to 75 pounds and diameters up to 20 inches. According to the manufacturer, the simplicity of operation of the machines insures ease of use by unskilled operators in balancing impellers, blower wheels, flywheels, fans, pulleys and a wide variety of other parts having no integral shaft.

Magnitudes of unbalance are positively indicated by a large, easy-to-read meter which is calibrated directly in terms of unbalance correction procedure selected. Angular positions are accurately pointed out by a stroboscopic lamp and are readable either as a location to remove weight or as a location to add weight, dependent upon the users' correction procedure. Working

areas and controls designed for optimum operator convenience are said to provide for high production rates on close tolerance work.

For more data circle 4 on Reader Service Card



BRUSHING MACHINES

New power brushing methods for removing burrs, blending surface junctures and performing other brush finishing jobs will be shown in Booth No. 466 by The Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland 14, Ohio. In addition to demonstrating the Brushmatic 3A machines, Osborn will have available information and production data on the Brushmatic 301 Series, new completely-automated equipment designed for high speed production line



Beko Vertical Static Balancing Machine Osborn Brushmatic 3A Brushing Machine



ASTE Exposition . . .

work. The new Brushamatic machines are said to take the time-consuming hand work out of removing burrs and finishing parts of varied sizes.

The Brushamatic 3A, one of several semi-automatic brushing units, quickly and efficiently finishes metal parts to controlled quality at low cost. The operation of this brushing machine is claimed to be so easily learned that an unskilled operator can attain high quality and rapid production quickly. On the semi-automatic machines, the job of the operator is placing the workpiece on the work-holding fixture. Once this is done, his job is complete until the work is brushed and ready to be removed. The brushed work is removed, and another unfinished workpiece is placed on the work-holding fixture. The operator simply loads and unloads; all other operations can be predetermined and are preset. The feeding and retraction of the work holder and the rotation of the brushes are automatically controlled on a preset time cycle.

For more data circle 5 on Reader Service Card



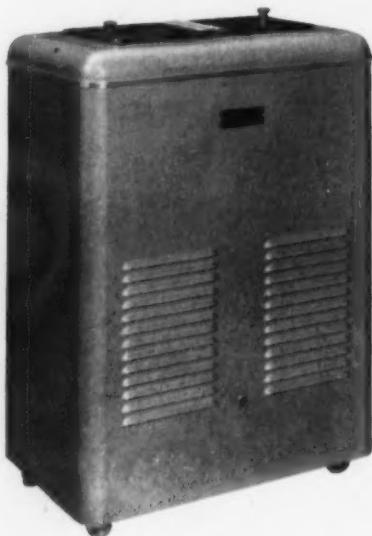
INDUSTRIAL CHILLING MACHINES

In Booth No. 665, Cincinnati Sub-Zero Products, 3930-S5 Reading Rd., Cincinnati 29, Ohio, will exhibit the Models A-120-2, R-120-10 and V-120-4 Industrial Chilling Machines. The Model A-120-2 has recently been developed to meet the many requests from industry for compact equipment for experimental and testing applications, as well as smaller production requirements. The unit is said to be ideal for laboratory and pilot plant use and is completely portable. The machine has a temperature range of from minus 70 to minus 135 degrees F., and will chill approximately 10 pounds of steel

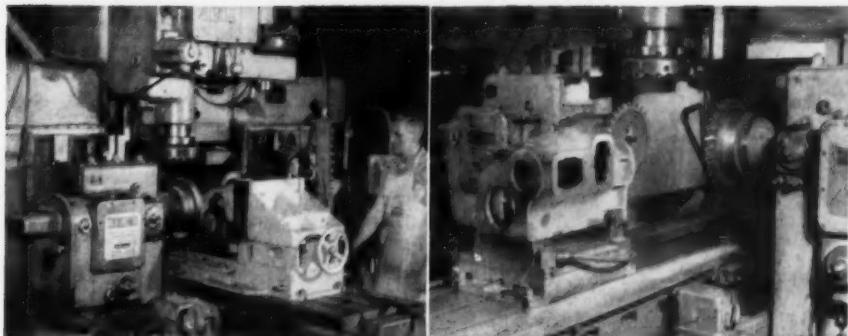
per hour from plus 80 to minus 120 degrees F. Outside dimensions of the chilling machine are 32 inches long x 20 inches wide x 43 inches deep.

The Model R-120-10 is especially engineered for large scale production chilling and is capable of chilling approximately 85 pounds of steel per hour from plus 80 to minus 120 degrees F. when convection fluid is used in the chamber. The machine is of all-steel construction, and operation is said to meet high standards of efficiency. Chamber size of the standard model is 30 x 18 x 33 inches deep. All machines are custom-built to meet users requirements, and special R-120 models can be provided with special chamber sizes as needed for special applications.

The Model V-120-4 is designed for metallurgical applications, as well as laboratory and pilot plant operations. Claimed to be eminently suited to small-scale production chilling or test-



Sub-Zero Model A-120-2 Chilling Machine



Sundstrand magnetic fixture provides two-way holding for duplex milling ends of case.

Base unit only, used when milling pads on side of case.

**ACCURACY,
TOOL LIFE &
PRODUCTION**

improved with
SUNDSTRAND
Magnetic Fixtures

A manufacturer of road grading machinery now uses two Sundstrand magnetic fixtures for holding transmission cases while milling the ends, top and various side pads on a three spindle Rigidmil. Only two fixtures are required to hold the parts for the three different operations required to complete the milling of the various surfaces. Lot sizes range from 50 to 100 pieces. The two Sundstrand fixtures replaced the four tunnel type mechanical fixtures previously used, eliminating much of the time and fatigue of hand clamping.

Additional Data....



...is available on many interesting and profitable Sundstrand magnetic clamping fixture applications. Write for your copy today. Ask for Bulletin 565M.

SUNDSTRAND
Magnetic Products Co.

Division of Sundstrand Machine Tool Co.
1020 - 9th ST. • ROCKFORD, ILLINOIS

For more data circle 441 on Reader Service Card

ASTE Exposition . . .

ing, the machine has a temperature range of from minus 70 to minus 130 degrees F. It is of sturdy all-steel construction and affords high operating efficiency with economical operation. For more data circle 6 on Reader Service Card

★ ★ ★

PUNCH PRESSES

Representative models of the Rousselle line of punch presses will be exhibited in Booth No. 1506 by Service Machine Co., 2310 W. 78th St., Chicago 20, Ill. The machines will include the

No. 2 (15-ton) open back inclinable press, the Model 3G (25-ton) deep throat press, the No. 4W (40-ton) double crank gap press with adjustable bed, and the No. 15H (15-ton) horn press. Still newer models, scheduled to be ready on or about show time, may be on display if time will permit. There are now 25 models of Rousselle presses, in 5 to 40-ton sizes, all with the same characteristic operating simplicity and rigid accuracy essential in keeping output uniform and die wear down to a minimum.

For more data circle 7 on Reader Service Card

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INDUCTION HARDENING AND FLAMATIC HARDENING MACHINES

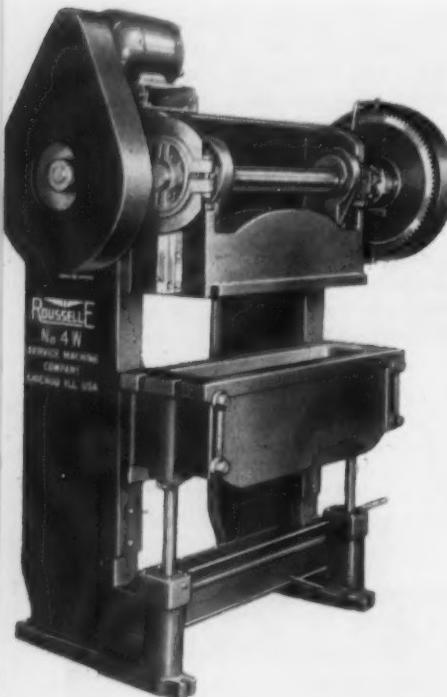
In Booth No. 100, The Cincinnati Milling Machine Co., Process Machinery Division, Cincinnati 9, Ohio, will feature an induction hardening machine and a Flamatic hardening machine. The induction hardening machine will demonstrate many new and unique features in induction hardening equipment in a production run on automotive turbine shafts. This machine is fully automated. The Flamatic hardening machine will be selectively surface hardening automotive sprockets in a production run using Chicago city gas. The machine will demonstrate electronic temperature control for rapid and accurate repetitive reproduction of exacting physical and metallurgical specifications.

For more data circle 8 on Reader Service Card

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TURRET DRILLING MACHINES

Burg Tool Mfg. Co., Inc., 15001 S. Figueroa St., Gardena, Calif., will demonstrate its new Burgmaster Model 1C Turret Drilling Machine in Booth No. 389. This machine is designed to



Rousselle No. 4W Double Crank Gap Press



PERFECT FOR INTERNAL HOLES
AND IRREGULAR DIES



REACHES "INACCESSIBLE"
PLACES — THE FINEST DETAILS



TO FINISH IRREGULAR
AND CURVED SURFACES—
ALSO SHOULDERs AND RECESSES

Di-Profiler

RECIPROCATING HAND MACHINE



A rapid, accurate, easy-to-operate tool that saves costly hours on dies, molds and precision parts. Indispensable for filing, scraping, lapping and polishing operations involving flat or curved surfaces. Intricate details are finished in a fraction of normal time.

The Di-Profiler has a stroke adaptable from 0 to 6 mm. ($\frac{1}{4}$ "); reciprocation can be varied from 0 to 100 strokes per second.

Accessories include steel and diamond files, diamond discs, laps, T-C scrapers, and other tools.

For complete details, write Dept. DS-36.

ENGIS EQUIPMENT COMPANY

431 S. DEARBORN ST. • CHICAGO 5, ILL.

Special products for finishing

HYPREZ DIAMOND COMPOUNDS



For all finishing jobs, from roughing to mirror polish, Hyprez, the original Diamond Compounds, have world-wide acceptance for their superior quality and results.

The exclusive Hyprez vehicle, exactly graded diamond particles, rigid control of quality, all guarantee that Hyprez will do your finishing job best. Available in 18- and 5-gram sealed cartridges for use with the Hyprez Applicator Gun.



For complete details, write Dept. HS-36.
Visit Space No. 1020, A.S.T.E. Exposition, Chicago, March 19-23.



FOR FINER FINISHES
FASTER ON DIES



ASSURES LONGER TOOL LIFE,
GREATER PRODUCTION



COST SAVINGS FOR MOLDS
AND HOBS

ASTE Exposition . . .

fill the need for a small, fast unit. It is said to be capable of easily handling holes up to $\frac{3}{8}$ inch in steel and has a 7-inch stroke and a speed range of from 325 to 4,050 r.p.m. The Burgmaster 1C features fast power indexing, sensitive feed, preselective speeds and stops, time savings and maximum accuracy by elimination of quick-change tools, and the ability to perform any combination of six operations in one setup.

Other machines which will be operating in the exhibit include the Model 3BH, eight-spindle automatic hydrau-

lic; the Model 2BH, six-spindle automatic hydraulic; the Model 2BR, six-spindle ram-type radial drill; and the Model 2B six-spindle hand operated. Also, Burgmaster accessories and the "Tool-flex" line of full floating toolholders will be shown. As an added note of interest, the Model No. 1, the first production machine manufactured by the company, will be on display.

For more data circle 9 on Reader Service Card

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SPACERS, CHUCKS, TOOLHOLDERS, CYLINDERS AND MANDRELS

In Booth No. 652, Erickson Tool Co., 2304-11 Hamilton Ave., Cleveland 14, Ohio, will introduce the Master Spacer which is designed to accurately position work for a wide variety of machining operations. Timken bearing construction is used for maximum accuracy and rigidity. The bearings, it is claimed, allow the work to be trued in position with the brake off because when it is clamped, the spindle remains unchanged. This means true angular accuracy with relation to the centerline of the workpiece. The Master Spacer is supplied with a 6-inch precision three-jaw chuck.

Also displayed will be a complete line of precision collet chucks, adjustable and full floating holders, air chucks and air cylinders, expanding mandrels, speed indexers, pneumatic bar feed, boring bars, colletmandrels and related tools.

For more data circle 10 on Reader Service Card

★ ★ ★

11-INCH HYDRAULIC COPYING LATHE

In Booth No. 415, Stanley Sheppard, 30 Church St., New York 7, N. Y., will display the Harrison 11-Inch Swing Lathe which features an inbuilt hy-



Burgmaster Model 1C Turret Drill in use



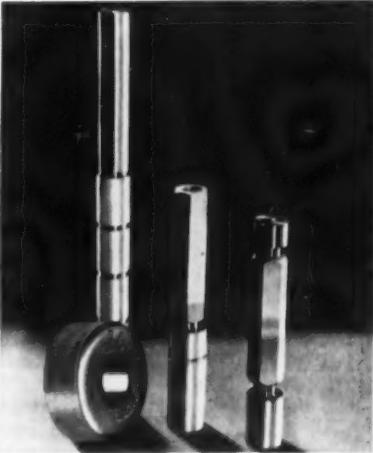
**Don't Scrap Your
Worn Gages**

Lincoln Park

**Will Salvage Them By
Hard Chrome Plating
or Carb-O-Plating**

When your gages have apparently outlived their usefulness, then is the time to send them to Lincoln Park for salvaging.

Two methods are used—either hard chrome plating or Carb-O-Plating. In the chrome plating process, the gages are carefully prepared for plating, are hard chrome plated, and then finished. When Carb-O-Plating is employed, a thin wear-resistant coating of tungsten carbide is applied over the steel base. This coating



has approximately the same properties as sintered carbide—92% tungsten carbide and 8% cobalt.

In both cases, the gages are not only restored to exact size and tolerances, but provide a wear life far in excess of that of the original gages. If you're looking for new ways to cut inspection costs, it will pay you to investigate Lincoln Park's salvaging processes. Let us send you full information.



THE PLUS IN PRECISION

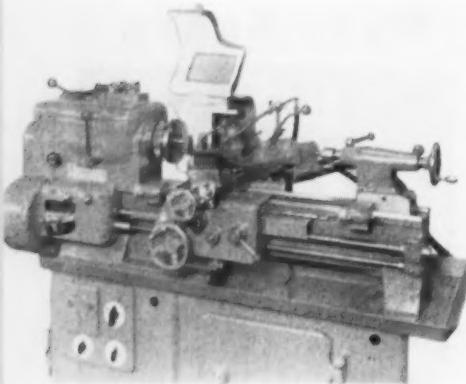
Lincoln Park

INDUSTRIES, INC.

1719 FERRIS AVENUE • LINCOLN PARK 25, MICHIGAN

For more data circle 443 on Reader Service Card

ASTE Exposition . . .



Harrison 11-Inch Hydraulic Copying Lathe

draulic copying attachment. Utilizing an all geared head, the lathe has 22 inches between centers. A two-speed, three-phase, 1½-h.p. motor provides 16 spindle speeds ranging from 45 to 2,000 revolutions per minute.

The machine is said to feature push-button control with thermal overload protection; reversing control; electrical isolation box; American taper nose spindle L00; clutch and brake; quick-change gearbox; and steel cabinet base with lock and key. The following are included as standard equipment: 6-inch drive plate, steady rest, follower rest, two cone centers, two micrometer saddle stops, 10-inch face plate, square tool post turret, chip pan, one live center, two carbide tools and wrenches.

Other machines to be displayed under power include the Harrison 11-Inch Precision All-Geared Gap Lathe; the Harrison 16-Inch Precision All-Geared Gap Lathe; the Adcock & Shipley Model "I" Automatic Feed Horizontal Milling Machine; the Adcock & Shipley Type "SV" High Speed Radial Drilling and Tapping Machine;

and the Adcock & Shipley Model No. 2AG Plain and Universal Type Milling Machines.

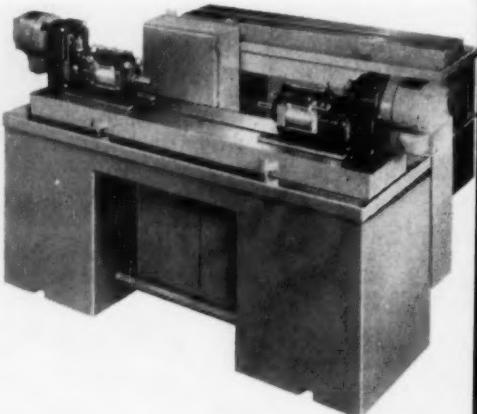
For more data circle 11 on Reader Service Card

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DOUBLE END MACHINE

In Booth No. 246, Hause Engineering, Montpelier, Ohio, will display its double end machine which is a standard unit designed for high production drilling, tapping and most other end-cutting tool operations. Available in three basic styles, the machine incorporates a modern design steel weldment base, two Model 24 Holomatic units and complete air and electric power and cycle control system. The machine is supplied ready for operation; a user needs only to furnish and mount fixtures and tooling to start production. The Holomatic units can be positioned on the wide top surface to machine holes that are opposed, offset, angular and up to 35 inches apart. Multiple spindle heads can be used for machining several parallel holes from either or both sides.

Automation devices, such as air



Hause Standard Double End Machine

Abrasive Cutting

*the best way to cut many materials
the only way to cut some*

Allison Cut-Off Wheels



Wide variety of shapes and materials cut with abrasive wheels

- Speed and quality of cut make abrasive cutting ideal for a wide range of operations. For example: one inch cold rolled steel can be cut with a wheel cost of under $\frac{1}{4}$ cent per cut and in 3 seconds.

ALLISON Cut-Off Wheels can provide smooth, high-quality cutting for almost any type of material however hard. These include steels of practically all analyses including corrosion-resistant types, brass, bronze, Monel Metal and other non-ferrous; aluminum alloy, magnesium and many others.

Whatever the problem there is an ALLISON Abrasive Wheel to meet it. Rubber bonded wheels give long wheel life and smooth, fine-finish cuts for wet cutting. Resinoid bonded wheels are best for dry cutting when quality requirements are less exacting.



Send for Booklet

*"ABRASIVE
CUTTING"
Today*



**ALLISON DIVISION
AMERICAN CHAIN & CABLE**

254D Island Brook Avenue, Bridgeport 2, Conn.

For more data circle 444 on Reader Service Card

March, 1956

modern machine shop 189

ASTE Exposition . . .

clamps, index tables, shuttle tables, part feeders and escapement units can be quickly installed and easily interlocked with the operation of the Holomatic units. Wiring and plumbing circuit diagrams and hook-up instructions are provided to simplify the installation of most standard automation components. The Holomatic units are rated at 2 h.p. and can be equipped for operation of the spindle at speeds of from 190 to 10,000 revolutions per minute.

Other equipment to be displayed includes an automatic drill press and the Model 24 Holomatic Drill Unit.

For more data circle 12 on Reader Service Card

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PRECISION FASTENERS

High torque set screws, ultra high strength wrenches for accurate tightening of socket head screws, and Hi-Ti titanium aircraft fasteners will be among the products displayed in Booth No. 479 by the Standard Pressed Steel Co., Jenkintown, Pa. Other products which will be shown include SPS micro screws and micro self-locking nuts; Unbrako cap and set screws; Umbraco Dryseal-Thread hydraulic pressure plugs; Unbrako dowel pins; Sel-Lok spring pins; and Hallowell shaft collars.

For more data circle 13 on Reader Service Card

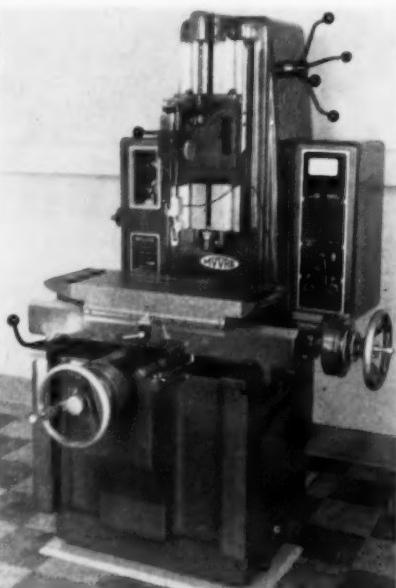
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UNIVERSAL MEASURING MACHINE

A new universal measuring machine for ultra-precise measurement and inspection will be featured in Booth No. 1430 by Moore Special Tool Co., Inc., 730 Union St., Bridgeport 7, Conn. According to the manufacturer, the unit offers a machine combining the capacity for larger workpieces, choice of

electronic indicator supported on an accurate, rotatable spindle, or a universal microscope for pickup, and a combination of rectilinear and angular positioning, making possible the measurement of the most complex contours. The machine has a work capacity of 11 x 18 x 12 inches in height. The cubic concept of geometric accuracy, developed in the Moore jig borer and jig grinder, is claimed to be carried to its ultimate refinement in the measuring machine. Table positioning in two directions of travel is accomplished by means of master lead screws. All ways are hardened, ground and lapped steel, fitted to hand-scraped cast iron. These ways, which are prismatic in section, are said to eliminate the need for gib adjustments.

Used in combination, the Moore Super-Rotary Table (also to be displayed) provides angular positioning accuracy compatible with the coordinate



Moore Universal Measuring Machine

Announcing...



... THE ADDITION OF PRECISION END MILLS TO
THE ECLIPSE COUNTERBORE CUTTING TOOL LINE
with the acquisition of WADELL TOOLS of
North Branch, New Jersey!

These end mills, widely acclaimed in the industry, are unique in that their flutes and lands are ground in one continuous operation from solid hardened blanks. This insures identical dimensions throughout and eccentric relief rather than ground "back off". The cross-section affords maximum web strength and ideal rake contour.

Our proven precision automatic flute grinding method produces end mills giving superior performance which means longer life, finer finish and lower production costs.

For over 40 years Eclipse has specialized in hi-quality cutting tools; interchangeable carbide and high speed counterbores, countersinks, core drills and back-spatfacers. NOW precision end mills augment the ECLIPSE line making available another Eclipse tool in fields heretofore not serviced.

SEE THIS REMARKABLE NEW LINE AT THE
Booth 1121

A.S.T.E. INDUSTRIAL EXPOSITION and CONVENTION

INTERNATIONAL AMPHITHEATRE

CHICAGO • MARCH 19-23

ECLIPSE COUNTERBORE COMPANY

1600 BONNER AVE., DETROIT 20, MICHIGAN

END MILL DIVISION—NORTH BRANCH, N. J. (ADDRESS BOX 97, HARRISON, N. J.)



For more data circle 445 on Reader Service Card

ASTE Exposition . . .

positioning accuracy of the machine table. The Microsine Table extends this same accuracy to compound angular settings. Together with these accessories, the measuring machine provides a universal facility on a level of accuracy expected in international standards laboratories.

For more data circle 14 on Reader Service Card

★ ★ ★

OPTICAL PROFILE GRINDER

Eric R. Bachmann Co., Inc., 27-11 41st Ave., Long Island City 1, N. Y., will feature the Loewe Model SP Optical Profile Grinder in Booth No. 1301. This machine is claimed to be ideally suited for the form tool grinding of flat and circular form tools, section-

al dies and punches, gages and templates. The grinder features a 20 x 20-inch shadowgraph screen with two magnifications of 25 and 50 times. The grinding wheel slide has a stroke of 3-5/16 inches and allows adjustments for lateral relief angles of plus or minus 15 degrees and axial relief angles up to 35 degrees; any compound angle within these ranges also can be ground. The machine has two optical systems—one for shadowgraph projection and one for reflection projection. The drives for the grinding wheel spindle and the stroke are steplessly adjustable through d.c. motors. Combining a shadowgraph comparator with a highly precise form tool grinder is said to facilitate greatly and speed up the grinding of the most complicated irregular contours by operating the two handwheels simultaneously or independently. A dust collection unit, circular form tool grinding attachment and crush dressing attachment are available as extra equipment.

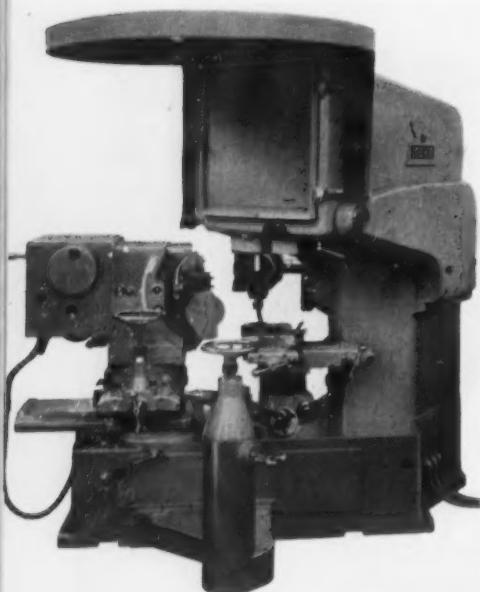
Also displayed will be the Herminghausen Model SR-1 Precision Centerless Grinder, the Gauthier Model W-1 Fine Pitch Spur Gear Hobber, the Weiler Model RDU-260/38 1-Inch Hand Turret Lathe, the Berlett Small Automatic Circular Saw, Piltz High Precision Ground Threading and Hobbing Tools, the Kuhlmann Model FSM Tool and Cutter Grinder and the Schlenker Model V-800 Shaper.

For more data circle 15 on Reader Service Card

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MILLING MACHINES AND SHAPERS

In Booth No. 550, Austin Industrial Corp., 76 Mamaroneck Ave., White Plains, N. Y., will exhibit for the first time the Sajo No. 2 Model VF-54 Vertical Milling Machine which features a working surface of 47 $\frac{1}{4}$ x 11 inches and a longitudinal power feed of 33 $\frac{1}{2}$ inches. The machine has 12 spindle speeds, ranging from 39 to 1,500 r.p.



Loewe Model SP Optical Profile Grinder

Abrasive Cutting Campbell Cut-Off Machines

*the best way to cut many materials
the only way to cut some*



Rough, serrated cut
of metal saw

Smooth-finished cut
of CAMPBELL Abrasive
Cut-Off Machine
with ALLISON Wheel

Smooth cutting saves grinding operation for American Gear & Mfg Co.

Cross sections of gear teeth—smooth, fine-finished and ready for metallurgical study—save an entire extra grinding operation at the Lemont, Illinois plant of American Gear & Mfg. Co., a division of Brad Foote Gear Company.

These test samples are neatly "sliced" down to a single gear tooth in thickness on a CAMPBELL 406 Oscillating Wet Abrasive Cut-Off Machine, equipped with just the right ALLISON Abrasive Wheel for the job. These sections with fine finish, no hard spots, no change in metallurgical characteristics, come from the wet cut with abundant coolant applied just where it does the most good. It's the OSCILLATION of the abrasive wheel . . . the right one for the job . . . that handles big cuts like this with speed and economy.

* * *

What is your metal cutting problem? Does it involve cutting of alloy or high carbon steel? Our Field Engineers, abrasive cutting specialists, can help you arrive at that particular combination of CAMPBELL Cut-Off Machines and ALLISON Cutting Wheels that will improve your operation and save you money.

*Let us send you
this book*



ACCO



**Campbell Machine Division
AMERICAN CHAIN & CABLE**

931 Connecticut Avenue, Bridgeport 2, Connecticut

For more data circle 446 on Reader Service Card

March, 1956

modern machine shop 193

ASTE Exposition . . .

m., which are selected by a direct reading dial and single crank. It utilizes a hardened, chrome-nickel steel spindle with an American Standard No. 50 milling machine taper. The spindle is mounted in SKF precision staggered roller bearings combined with SKF thrust ball bearings. The spindle head can be swivelled 45 degrees left or right from the vertical.

Also displayed will be the VMA Model ES-22 Heavy-Duty Universal Shaper with a 22-inch stroke; the Sajo No. 2 Model UF-54 Standard-Duty Universal Miller; the Sajo No. 2 Model PF-53 Light-Duty Plain Miller; the Sajo No. 2 Model PF-49 Light-Duty Plain Miller; the VMA Model ES-26

Heavy-Duty 26-Inch Stroke Shaper; and the VMA Model EV-3 Standard-Duty 18-Inch Stroke Universal Shaper.

For more data circle 16 on Reader Service Card



LOW TEMPERATURE MELTING METALS

In Booth No. 773, Cerro de Pasco Corp., 304 Park Ave., New York 22, N.Y., will exhibit the Cerro Alloys (low temperature melting metals) and the raw materials which make up these interesting and useful compositions. Also, the company will have mounted on its booth a number of examples of applications of the Cerro Alloys, such as work-holding devices, illustrations of tube bending and metal forming, anchorage of punches in sheet metal stamping dies, examples of the electro-formed parts for microwave communications, guided missiles, and so on. To supplement the fixed items on the exhibit panel, there will be slides projected on the backdrop periodically during exhibition hours, illustrating items not suitable for mounting on the exhibit.

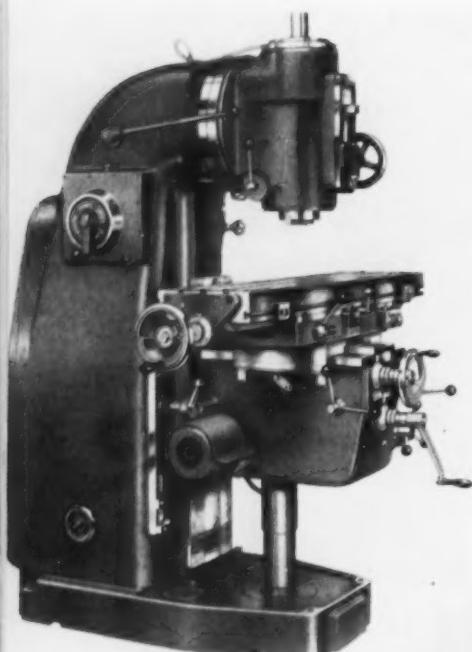
Believed to be the highlight of the display will be the application of making molds for injection molding of polystyrene plastic. The molds will be made by the method of spraying Cerrocast against master patterns and, at the same time, will serve to demonstrate a type of low temperature melting metal spray gun available for the purpose. Special low temperature melting solders for soldering glass, glazed ceramics and metals will also be shown.

For more data circle 17 on Reader Service Card



MARKING EQUIPMENT

Noble & Westbrook Mfg. Co., 25 Westbrook St., East Hartford 8, Conn., will exhibit in Booth No. 767 a complete line of marking equipment. Fea-



Sajo No. 2 Model VF-54 Vertical Miller

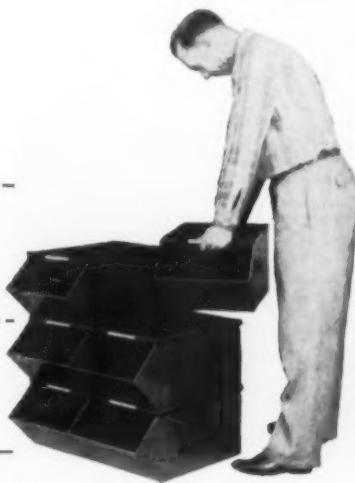
tured in the display will be the Model 442, a Series 21 dial-type marking machine which roll-marks permanent sunken impressions into thin wall tubes or sleeves on a production basis. The machine incorporates the Noblewest roll-marking process, wherein pressure is applied and a rolling action occurs between the marking die and work-piece. The Model 442 has a continuous rotating mandrel carrier dial, an adjustable die holder head and automatic unloading. Loading can be performed manually by means of a chute, or with a chute and a hopper feed. The machine to be featured will have a new safety circuit which will stop the machine in event of improperly loaded parts, either from the chute or by an operator, and will protect the operator who inadvertently gets too close to the die holder head. The machine has infinitely variable speed drive which can be easily set to suit the operator or to suit production requirements. The machine is said to be capable of marking at speeds up to approximately 100 pieces per minute.

Also displayed will be the Noblewest Series 50 general purpose marking machines. Included in these machines will be "Cyclomatic Control" which provides for continuous automatic operation of a dial feed air press or a pneumatic roll-marking machine that is basically single cycle in operation. The balance of the exhibit will include other dial marking and general purpose

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TIME**

**Save
SPACE**

**Save
LABOR**



Easy-to-store, easy-to-stack, easy-to-handle STACKBINS® speed and simplify parts and materials handling.

In Production: STACKBINS carry parts between operations.

In Assembly: STACKBINS replace open pans and boxes.

In Storage: STACKBINS keep parts instantly accessible — eliminate waste motions — stack solidly, compactly to form units tailored to your space limitations and capacity requirements.

Heavy, all-welded steel. Seven standard sizes from 3 1/2" x 6" x 3 1/4" to 15" x 24" x 11". Special purpose STACKBINS also available.

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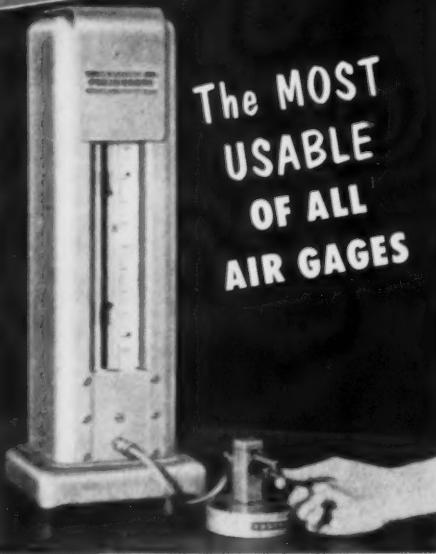
Stackbin Corporation, 1083 Main St., Pawtucket, R. I.
Mfgd. & Sold exclusively in Canada by: Wickware-Stackbin, Ltd., Ottawa

STACKBIN[®]  **SYSTEM**
"Stacked and Still Accessible"

For more data circle 447 on Reader Service Card

What You Can

WITH SHEFFIELD'S
PRECISIONAIRE

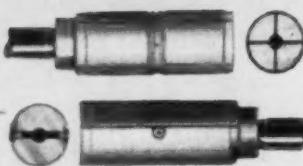


The MOST
USABLE
OF ALL
AIR GAGES

CHARACTERISTICS

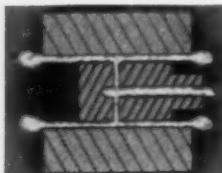
- High precision with instant response
- Has widest amplification range — 100 to 100,000-1
- Accommodates widest tolerance range — .000005 to .100
- Amplifications and tooling interchangeable
- Provides quickest change in amplification
- Longer scale facilitates classifying parts and provides greater approach range
- Easier to read — no need to squat and squint
- Human error minimized
- Checks one dimension or many simultaneously
- Elements have long service life

BASIC
INTERNAL
TOOLING
ELEMENTS

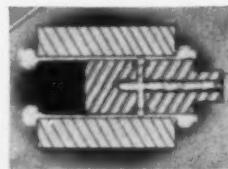


AIRJET SPINDLE

For True
Diameter



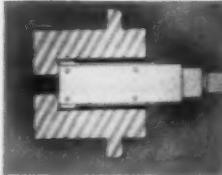
Standard stock spindle with two diametrically opposed open jets for holes having tolerances of .005" or less and surface finishes of less than 65 rms.



Balljet Spindles used for holes in porous or soft materials and for internal surfaces rougher than 65 rms.



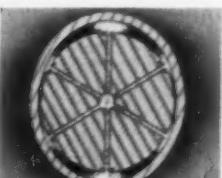
Plunjets mounted in a suitable fixture are used for larger holes and those having larger tolerances.



Bladejet Spindles are used in interrupted bores, bores having a keyway, to gage to the very bottom of a blind bore and for larger tolerance bores.



Adjustable spindles and kits are available to cover ranges of $\frac{3}{8}$ " to $\frac{1}{2}$ "; $\frac{3}{8}$ " to $1\frac{1}{2}$ "; $1\frac{1}{2}$ " to $3\frac{1}{2}$ "; and $3\frac{1}{2}$ " to $12\frac{1}{2}$ ".



For
Average
Diameter

Spindles having three or more jets equally spaced around the perimeter—especially effective in checking thin wall components.

7210

Learn About Holes*



BALLJET
SPINDLE



BLADEJET
SPINDLE



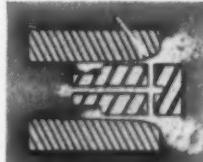
PLUNJET
CARTRIDGES

For Out-of-Round



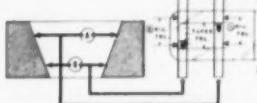
Indicated when any spindle is rotated through 90 degrees.

For Bell-Mouth



Indicated as any spindle enters or is withdrawn from the bore.

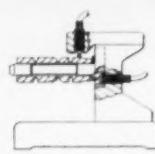
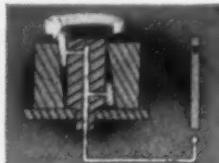
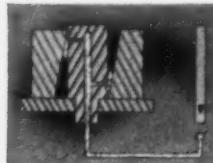
For Taper



Indicated as any spindle is passed through the bore. Spindles having two or more sets of jets may also be used. In larger bores and/or those having larger tolerances, Plunjets in a suitable fixture are used.



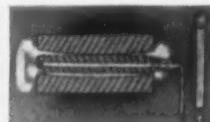
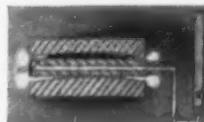
For Squareness of a Bore Axis with a Face



Spindle with opposed open orifices spaced longitudinally checks squareness of a bore axis with a face.

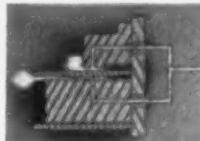
Plunjett fixtures may also be used.

For Camber



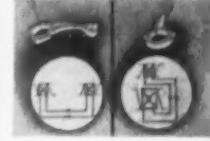
Camber or straightness of a hole is checked by rotating through 180° a spindle having four jets as indicated.

For Concentricity



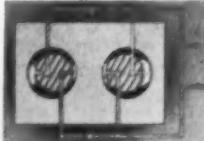
Opposed jets in a Locating fixture.

For Parallelism of Holes



By integrating two spindles in a fixture, such as those used for squareness checking.

For Center Distance Between Holes



By a fixture with two spindles each having two opposed jets.

*For checking external dimensions, relationships and countless other conditions, write to Div. 600, THE SHEFFIELD CORPORATION, Dayton 1, Ohio, U.S.A.



SHEFFIELD
manufacture and measurement for mankind

THAN ALL OTHER MAKES OF AIR GAGES

**"Do-It-Yourself"
Pays Off In
Heat Treating**



Why let someone else set your production schedules? If you now depend on outside heat treat sources, consider all the advantages of heat treating tools, dies, parts, etc., right in your own shop with a versatile TEMCO electric furnace. No bother with time-wasting pickup and delivery of work . . . no downtime while waiting for it to come back. Saves hours on jobs. Cuts costs . . . for TEMCO furnaces are economical to own and operate. Easy to hook up . . . easy to use. Eight models with chamber sizes from 4" x 3 1/4" x 3 1/4" to 9 1/2" x 8 1/2" x 18". \$60.00 to \$561.50 complete with controls. Write for data and nearest dealer's name.



ELECTRIC FURNACES

Thermo Electric Manufacturing Co.

488 Huff St., Dubuque, Iowa

For more data circle 450 on Reader Service Card

198 modern machine shop

ASTE Exposition . . .

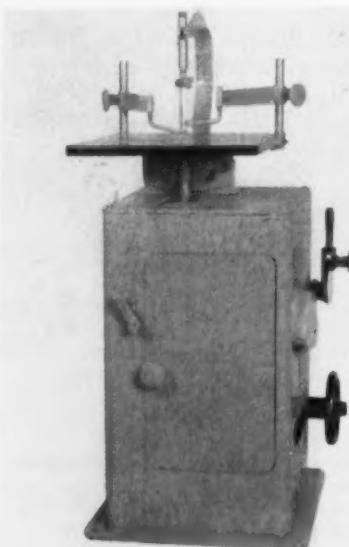
machines, bench-type roll-marking machines, the "Stampmaster" hand numbering device, automatic numbering heads, steel marking dies and the "Nobility" hand type holder.

For more data circle 18 on Reader Service Card

★ ★ ★

FLOOR-TYPE DIE FILING MACHINE

Rice Pump & Machine Co., Belgium, Wis., will show for the first time the Milwaukee Heavy-Duty Floor-Type Die Filing Machine in Booth No. 264. The new die filer will saw and file to the center of a 26-inch circle and provides 6-inches of clearance beneath the overarm. Features of construction include several ideas which are believed to be new to the die filer construction, such as tilting powered arbor, permit-



Milwaukee Heavy-Duty Die Filing Machine

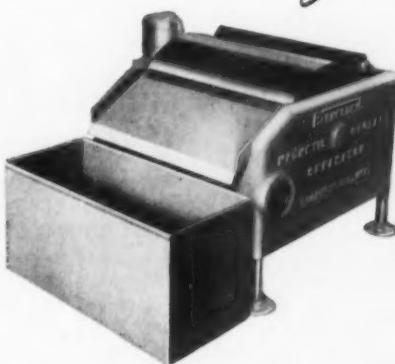
March, 1956

PRACTICAL COOLANT CLEANING

Automatically

WITH

BARNESDRIL MAGNETIC SEPARATORS



Barnesdril Magnetic Coolant Separators remove swarf, sludge and abrasive particles automatically from soluble and oil coolants to give you practical coolant cleaning.

Built in ten sizes — 1½, 3, 5, 10, 20, 30, 70, 100, 280, and 350 gallons capacity per minute these Separators constantly recondition coolant for recycling in production machining operations. Savings result from improved production quality, reduced maintenance and tooling costs, cleaner machine conditions and prolonged coolant life.

Complete data in Bulletin 151G



**FILTRATION DIVISION
BARNES DRILL CO.**

860 CHESTNUT STREET • ROCKFORD, ILLINOIS

For more data circle 451 on Reader Service Card

ASTE Exposition . . .

ting the operator to work on a level table. This table may be tilted when necessary, such as when sawing and filing compound angles. The new die filer has variable speeds from 80 to 350 strokes per minute and variable strokes from 0 to 5 inches, all in infinite variations. Overarms are power actuated,

thus qualifying the machine for large precision filing and sawing operations. For more data circle 19 on Reader Service Card

★ ★ ★

OPTICAL TAP CHECKER

Hanson-Whitney Co., Division of Whitney Chain Co., 173 Bartholomew Ave., Hartford 2, Conn., will feature in Booth No. 163 an optical tap checker which is de-

signed expressly for the important function of checking chordal hook or rake angles on taps of all types in a wide range of sizes. The instrument measures the angle formed by a line from the physical crest to the physical root of the thread on the tap, and a radial line to the physical crest of the thread. This measurement is accomplished by locating and positioning the tap on a rotary table. When the table is rotated, the tap is rotated about its own cutting edge or at the point formed by the intersection of the major diameter of the thread and a flute. This point is viewed through a microscope embodying a hair line focused on

over
8,000 Different Selections
For Immediate Delivery!



- Quality-Famous, Heavy Duty
AIR AND HYDRAULIC

CYLINDERS

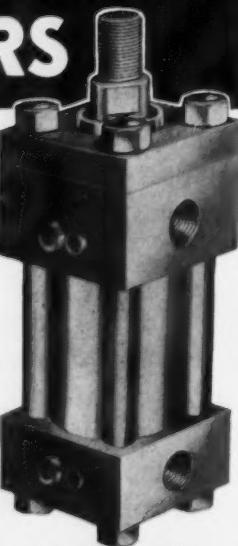
now "in stock" for
immediate shipment to you
in popular sizes, mountings

Eliminate costly production delays — speed-up your design and replacement programs — with this greatest quality selection ever offered on such fast delivery service.

AIR CYLINDERS, 200 psi, 1½" through 8" bores, strokes up through 36", over 15 popular mountings, cushioned and non-cushioned.

HYDRAULIC CYLINDERS, 2000 psi, 1½" through 5" bores, strokes up through 36", over 15 popular mountings, cushioned and non-cushioned.

Larger bores (up through 20" air, 12" hydraulic) and longer strokes (up to 22 feet) available on longer delivery.



Write for Complete
Data and Prices



MILLER FLUID POWER COMPANY
(Formerly Miller Motor Co.)

2024 N. Hawthorne Ave., Melrose Park, Ill.

CYLINDERS • BOOSTERS • ACCUMULATORS
Sales and Service From Coast To Coast

For more data circle 452 on Reader Service Card



Wilson "Rockwell"** Hardness Testers

**Is HARDNESS
an important factor
in your business?**

- If your business involves metals or, in many cases, plastics, successful operation often requires exact knowledge of the proper hardness of the materials you make or work with.



IN HEAT TREATING DEPARTMENTS—

WILSON "ROCKWELL" testing of hardened and tempered steels is almost universal. This is especially true for plain carbon and alloy steels. It is as easily done by a production worker as a metallurgist.

IN METALLURGICAL LABORATORIES—

They provide means for establishing thousands of hardness specifications. Their use insures quality of product, reduces defects and maintains good name and reputation.

IN TOOL ROOM OR PRODUCTION

They are relied upon for absolute guidance as to the hardness of tools and the metals to which they are applied. They are also ideal for production testing. Each test may take as little as 3 to 5 seconds.

* For complete information on WILSON "ROCKWELL" Hardness Testers call or write today. There is a WILSON model to meet every testing requirement.

*Trademark registered

See the WILSON line at BOOTH 909
at the ASTE Show, Chicago, March 18-23

ACCO Wilson Mechanical Instrument Division
AMERICAN CHAIN & CABLE



230-G Park Avenue, New York 17, N. Y.

For more data circle 453 on Reader Service Card

March, 1956



modern machine shop 201

ASTE Exposition . . .

the rotation axis of the table. As the table is rotated, all other points of the tap appear to revolve around the hair line. When the point at which the root of the thread and flute intersect is brought into the hair line, the line of view is the chordal line between the



STANDARD STEEL SPECIALTIES

• MACHINE KEYS

We can supply a complete line of finished machine keys including gib head and taper keys, rod keys, round end keys, etc.

• WOODRUFF KEYS

Complete stock of standard keys on hand for prompt shipment. Made from open hearth or alloy steel.

• TAPER PINS

Available in sizes 7/10 through 10 and lengths from 3/4 inch to 6 inches. Others made to specifications.

• MACHINE RACK

Can furnish rack from almost any size blank and pitch as well as length to form continuous sections.

Write for catalog

STANDARD STEEL SPECIALTY CO.

BEAVER FALLS

PENNSYLVANIA

Plants: Beaver Falls, Pa.; Hammond, Ind.

For more data circle 454 on Reader Service Card



Superior

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- Laboratory Quality Control.
- Rapid quotations.
- Savings from policy of no salesmen or representatives.
- Savings from a fully mechanized foundry and machine shop.

LEADING SUPPLIER TO LEADING USERS

Superior

BRONZE BUSHINGS

- Bushings made exactly as you want them.
- Emergency service when you need it.

BRASS WORKS, INC.
314 South Crawford Street
Detroit 17, Mich. 1-4322

For more data circle 455 on Reader Service Card



Hanson-Whitney Optical Tap Checker

crest and the root of the thread. The chordal angle or rake measurement is then read from the vernier scale on the rotary table. This vernier is engraved to 5 minute graduations.

Also exhibited will be a precision thread comparator; the complete line of "finished-after-hardening" taps, gages, hobs and thread milling cutters; and concentricity attachments which have been developed for use with the H-W external and internal thread comparators. The new concentricity attachments are said to make possible the

CASE HISTORY NO. 12—LAMINATION DIES

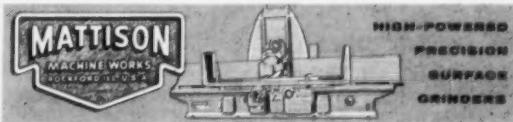


Courtesy: Allis-Chalmers Mfg. Co.

**Precision die sharpening shows versatility
of this production surface grinder**

These lamination dies are held by a magnetic chuck for sharpening on a Mattison High Powered Precision Surface Grinder. Down feed is set at .0005 in. and parallelism is closely held on the finished dies. Material is Neor die steel. Production was increased markedly and finish much improved when the Mattison grinder was put into operation. User is pleased with the machine, saying that in addition to the production increase and improved finish, it is easy to control and operate. Write for Bulletin "HP."

Mattison Machine Works, Rockford, Illinois, U. S. A.



For more data circle 456 on Reader Service Card

March, 1956

modern machine shop 203



Male stator die sharpened on Mattison High-Powered Precision Surface Grinder.

ASTE Exposition . . .

fast, accurate, visual gaging of the thread diameter in relationship with the face, outside diameters, bevels, and so on, of the workpiece. This is achieved by the rotation or contact of the work against the concentricity attachment, causing dial indicators to show the concentricity or amount of error between the pitch diameter of the thread and related surfaces. As this is accomplish-

ed, while the thread diameter is being gaged, separate checking of the work is eliminated.

For more data circle 20 on Reader Service Card

★ ★ ★

HACKSAWS, HAND MEASURING TOOLS AND PRECISION INSTRUMENTS

The L. S. Starrett Co., Athol, Mass., will exhibit 85 new tools in Booth No.

1116. The new tools are important additions to the complete line of Starrett mechanics hand measuring tools and precision instruments, steel tapes, steel rules, dial indicators and dial gages, hacksaws, hole saws, band saws and precision ground die and flat stock. A complete line of power and hand hacksaw blades, developed and production-proven in the Starrett Metallurgical and Production Testing Laboratory, will be featured. Each of the three types of blades has special characteristics for faster cutting, easier cutting and longer blade life on a wide range of cutting assignments. To make it easy to select

New!
Incomparable!
dyna-trol
ELECTRIC FURNACES

COMPARE THESE FEATURES

- Infinite Zone Control to 2000° and 2300°F
- Zone temperature indication by Pyrometer Selector Switch
- Porcelain Element Holders
- Automatic Hold and Cut-off instrument available
- Infinite Variety of Time-Temperature Curves Obtainable
- Rugged Construction. Highest quality insulation used.

COMPARE THESE PRICES

| Firing chamber (H. W. D.) | Semi-Auto. prices | Auto. prices |
|------------------------------|----------------------|-----------------|
| 6"x12"x12" | \$295. | \$432. |
| 12"x12"x12" | \$405. | \$550. |
| 9"x 9"x18" | \$480. | \$625. |
| 14"x14"x14" | \$525. | \$680. |
| 20"x20"x20" | \$975. | \$1140. |
| 18"x18"x36" | \$1125. | \$1375. |
| (To 2000° Maximum Temp.) | | |

Over 40 Standard Models — Write for complete literature

L & L

INDUSTRIAL DIVISION
MANUFACTURING CO.
CHESTER 71, PA.

For more data circle 457 on Reader Service Card

Tool Grinders

BY

EX-CELL-O



FOR CARBIDES —
CAST ALLOYS —
HIGH-SPEED STEELS

Ex-Cell-O's complete line of tool grinders sharpen single-point tools efficiently and economically. All are double-end models. All use cup-type wheels and have large easy-to-adjust tool rest tables.



There's an Ex-Cell-O Grinder to suit the needs of every shop, large or small. For data on Ex-Cell-O's complete Tool Grinder line, write to Detroit, or call your local Ex-Cell-O representative.

Style 44-A Ex-Cell-O Precision Carbide Tool Grinder is one of the newest models. With inbuilt motor precision spindles, and ample coolant pressure flow, it does fast work on a wide range of tool sizes.

**EX-CELL-O
CORPORATION
DETROIT 32, MICHIGAN**

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MANUFACTURERS OF PRECISION MACHINE TOOLS • GRINDING SPINDLES • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

For more data circle 458 on Reader Service Card

ASTE Exposition . . .

and use the right blade for any job, they are color-identified and have easy-to-remember trade names.

"Redstripe" SM Special Alloy High Speed Steel Power and Hand Blades combine new developments in heat treating with the long-wearing qualities of special high speed steel. They

Starrett® REDSTRIPES

Starrett® GREENSTRIPES

Starrett® BLACKSTRIPES

Starrett "Production-Proved" Hacksaws

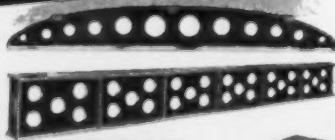
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and be precision sure!

CHALLENGE SURFACE PLATES

New! Clovis
Black Granite
Rated Class A.
Surface accuracy guaranteed. 24 sizes.
**Special Analysis
Semi-Steel**
Fine grain. Precision ground or hand scraped.

STRAIGHT EDGES
for lathe bed ways.
PARALLEL STRAIGHT EDGES for inspection of alignment.



**UNIVERSAL
BOX ANGLES**
Parallel to within
.00025-inch.



V-BLOCKS
V accuracy of
.0005-inch.



ANGLE PLATES
in 22 sizes for
clamping &
holding work.



BOX PARALLELS
In every size for
every use.

782

THE CHALLENGE MACHINERY COMPANY

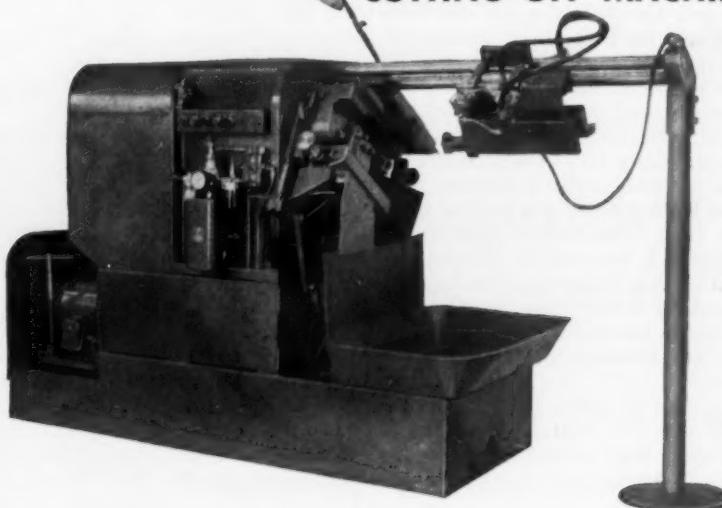
Office, Factories and Show Room:
GRAND HAVEN, MICHIGAN
DEALERS IN ALL PRINCIPAL CITIES



For more data circle 459 on Reader Service Card

are specially tempered for extra toughness and high speed cutting of hard materials with heavier speeds and feeds. "Redstripe" blades are yellow with a red stripe. "Greenstripe Safe-flex" Welded Edge Power Blades and Hard Edge - Flexible Back Hand Blades are yellow with a green stripe. The power blades are double welded to make them shatterproof, safer, straighter - cutting and longer lasting. They are particularly recommended for tough alloy steels, multiple cutting or interrupted cuts. The hand blades combine a hard cutting edge and flexible back in order to make them virtually unbreakable.

THE MODERN AUTOMATIC CUTTING-OFF MACHINE



Cuts Off Tubing, Pipe and Shafting . . . FAST

Cuts off longer pieces than a regular automatic machine. In fact, cuts off any length you want—and cuts it faster. If your production requires quantity cutting-off of tubing, pipe or shafting, check the figures below against your present time.

1/2" Tubing

This machine cuts off and chamfers both outside edges of $\frac{1}{4}$ " .030 wall tubing, 5" long at the rate of one every 2.5 seconds.

1 1/4" Cold Rolled

This machine cuts off and chamfers both ends of $1\frac{1}{4}$ " cold rolled, 20" long, at the rate of one every 20 seconds.

1" Tubing

This machine cuts off and chamfers both outside edges of 3" long, at the rate of one every 3 seconds.

These popular, time saving machines are now available in four sizes, handling work up to $6\frac{3}{4}$ " O.D. Their many cost cutting features are described and illustrated in our latest catalog that will be mailed promptly on request.

WRITE FOR ILLUSTRATED CATALOG

MODERN MACHINE TOOL CO.

Jackson, Michigan

For more data circle 460 on Reader Service Card

ASTE Exposition . . .

"Bluestripe" Selected High Speed Steel Power and Hand Blades are specially heat treated for high speed production sawing of hard-to-cut metals, such as high alloy steel, stainless steel, phosphor bronze, tool steel, rails, Allegheny metal, chrome steel, Monel, and so on. These blades are also recommended for general purpose cutting because one pitch of teeth will cut a wider range of metals. The "Bluestripe" blades are yellow with a blue stripe. These production-proved hacksaw blades are packaged in heavy-duty protective boxes which feature a red and yellow design with foldover labels on the top and end.

Other new products to be displayed include the No. 220 "Mul-T-Anvil" Micrometer with interchangeable anvils; No. 818 Automatic Center Punch;

No. 657 Magnetic Base Indicator Holder; "Safe-Flex" Welded Edge Hole Saws; and the Model No. 253 Dial Indicator Set.

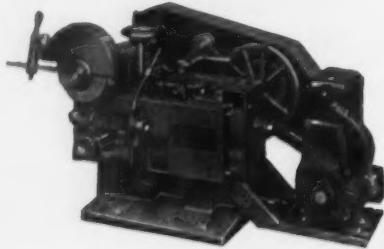
For more data circle 21 on Reader Service Card

★ ★ ★

BEARING LUBRICATION UNITS

In Booth No. 325, C. A. Norgren Co., 3400 S. Elati St., Englewood, Colo., will exhibit three new bearing lubrication units, designated as "Micro-Fog" Lubro-Control Units—one of 200 bearing inch capacity, one of 300 bearing inch capacity and another of 1,000 bearing inch capacity. A hand screw machine, which will be in operation, will be equipped with a 200 bearing inch unit for lubricating machine components and a Spray-Lube system for the application of cutting oil to the cutting tools. Other new products to be exhibited are the new $\frac{3}{4}$ and 1-inch

Costs Less Than 5¢ Each To Sharpen Metal Saws in Gangs



Wardwell sharpens up to 115 saws .015 thick at one time. Makes them better than new. Includes slitting and screw slotting saws, also milling cutters up to $5\frac{1}{2}$ " diameter. Completely automatic. All you do is start it.

Save money — put a Wardwell "35T" to work for you NOW.

Write for Bulletin "35T"



WARDWELL MANUFACTURING CO.

3803 Ridge Road Cleveland 9, Ohio

Maker of largest line of saw and tool sharpening machines

For more data circle 461 on Reader Service Card

| | |
|------|------|
| 1935 | E-6 |
| 1936 | E-8 |
| 1937 | 710 |
| 1938 | E-5 |
| 1939 | 509 |
| 1940 | E-12 |
| 1941 | |
| 1942 | |
| 1943 | |
| 1944 | |
| 1945 | 606 |
| 1946 | |
| 1947 | |
| 1948 | |
| 1949 | |
| 1950 | 743 |
| 1951 | E-3 |
| 1952 | E-18 |
| 1953 | E-25 |
| 1954 | 8-A |
| 1955 | |
| 1956 | 6-A |

**SINCE 1935
CARBIDE
FOR
EVERY
MACHINING
NEED**

Meet Willey's Series "A"

**two new steel cutting
grades join WILLEY'S
family of industrial carbides**

8-A for roughing cuts
6-A for finishing cuts

Specifically designed for machining tough steels, alloy steels and high tensile strength steels, they thoroughly prove their superiority in actual production runs.

Permitting 30% higher feed and speed rates.

Producing Up to 8 times more finished pieces per grind than previous steel cutting carbides.

Increasing Automatic machining operations as high as 146%.

Setting New production records in Automated machining operations.

These two—totally new—**Vacuum Sintered Carbides** have a purity and uniformity in structure that provide a consistent quality not found in previous carbides. The far greater edge strength coupled with exceptional wear qualities and increased cratering resistance offer the users—the best tool performance and—top production results.

TRY—SERIES 8A & 6A, they are available from stock in standard blank sizes. Prompt delivery on pre-formed blanks made to your specifications. Call your Willey's distributor or write:

WILLEY'S CARBIDE TOOL COMPANY
1340 W. Verner Hwy. • Phone Woodward 1-9444 • Detroit 1, Michigan

see us at the tool show . . . booth 653

For more data circle 462 on Reader Service Card



ASTE Exposition . . .

automatic-drain filters, as well as other new filter models.

The entire back wall of the display will be illuminated in color through the use of color transparencies to illustrate the broad line of Norgren air filters, pressure regulators and Oil-Fog and



TRUE POINT DRILL SHARPENER

for Drills 41 - 60 and
61 - 80 R.H. & L.H.

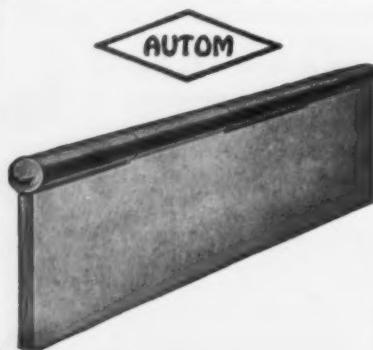
A properly sharpened drill cuts
faster — more accurately and is
less likely to break.

Write for circular and
full details.

UP-TO-DATE TOOL CO.

P. O. Box 99, Station A, Worcester 8, Mass.

For more data circle 463 on Reader Service Card



CONTINUOUS HINGES

Manufactured by

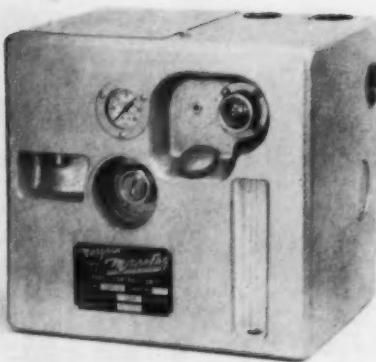
**AUTO MOULDING
& MFG. CO.**

WRITE FOR CATALOG

1114 E. 87TH ST.

CHICAGO 19

For more data circle 464 on Reader Service Card



Norgren "Micro-Fog" Lubro-Control Unit

Micro-Fog Lubricators, as well as an assortment of lubrication applications with brief details on results produced. A counter around the hand screw machine will be equipped with sound to describe the two Norgren lubrication units in the machine.

For more data circle 22 on Reader Service Card

★ ★ ★

PRECISION TOOLING

DeVlieg Microbore Co., 2720 W. Fourteen Mile Rd., Royal Oak, Mich., will exhibit a comprehensive range of Microbore Precision Tooling and Microbore Flash-Change Tooling in Booth No. 421. The Microbore Tool-

SURE GRIP STEP BLOCKS

STUD

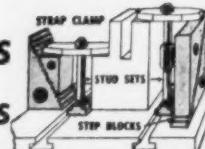
SETS

STRAP

CLAMPS

DEPT. SB-1

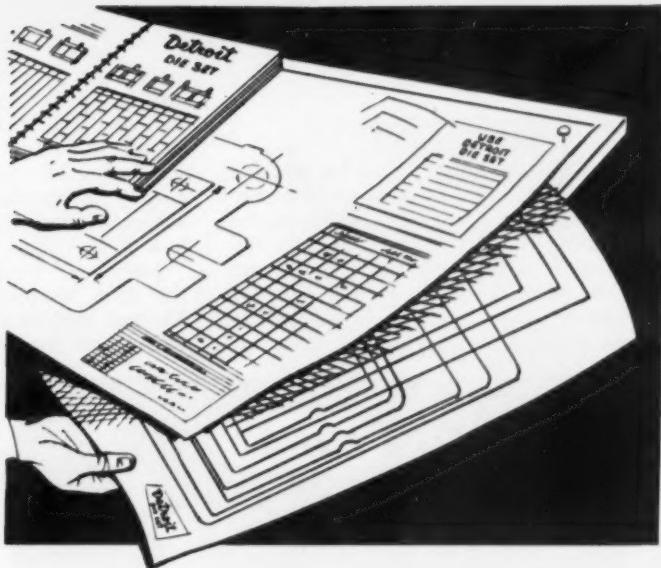
TIETZMANN TOOL CORPORATION
ENGLEWOOD



OHIO

For more data circle 465 on Reader Service Card

Cut DIE COST...



BEFORE
the
design
gets off
the
board

Save die designing time with Detroit Die Set time savers. Easy-to-use catalog puts all needed information flat in front of you. Heavy paper die set templets (free on request) quickly determine size—save drafting time. Just slip under layout and trace most economical size for the job.

For more difficult jobs, a Detroit Die Set engineering representative is as near as your phone. He can quickly answer questions about special die sets, bushings, etc.

Start cutting die design cost now. Specify Detroit Die Sets. Available in all sizes and materials. Precision or Commercial tolerances. Stock die sets shipped within 24 hours. Unusually fast service on specials, too.

Offices
in Principal
Industrial Centers

2895 WEST GRAND BLVD.
DETROIT 2, MICHIGAN

Detroit
DIE SET
CORPORATION

For more data circle 466 on Reader Service Card

ASTE Exposition . . .

ing System is built around a standard range of multi-purpose single-point adjustable tools which can be applied to all types of work, ranging from one-piece jobs to mass production operations, with a high degree of efficiency and economy. The tools can be adjusted rapidly and accurately to precise

limits by a proven micrometer vernier principle which greatly facilitates tool changing and tool settings. The exhibit will include a wide range of standard boring bar sets and an impressive display of special production tooling designed around standard Microbore tool units.

Introduced for the first time will be the new Microbore Flash-Change Tooling System for quickly changing tools in all types of boring and milling machines without damage to the machine spindle. Flash - Change toolholders are said to provide maximum rigidity for all types of drilling, boring and milling operations, and tools can be changed in a matter of seconds. Flash - Change boring bars and adapters are located radially in the toolholders by means of driving keys, thus insuring positive repositioning of tools. This

Specify IDEAL

LIVE CENTERS

Guaranteed to match the accuracy and capacity of your lathe . . .

Widest range of models, load capacities and tapers for every job!

ORDER FROM YOUR IDEAL DISTRIBUTOR OR MAIL COUPON

IDEAL INDUSTRIES, Inc.
1031 Park Ave., Sycamore, Illinois

Kindly send us data on Ideal's complete line of LIVE CENTERS.

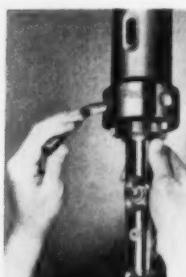
NAME _____

COMPANY _____

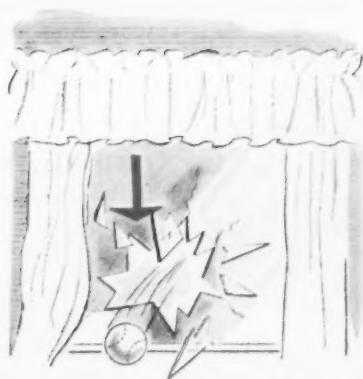
ADDRESS _____

CITY _____ ZONE _____ STATE _____

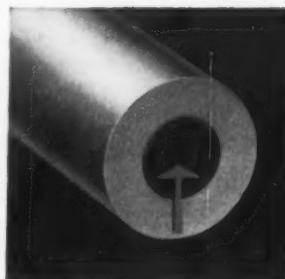
For more data circle 467 on Reader Service Card



Microbore Flash-Change Tooling



a hole here means work... a hole here saves work



Crucible Hollow Tool Steel Bars take much of the work out of making ring-shaped steel parts, or tools with a center hole. The hole's already there. You save expensive drilling, boring, cutting-off and rough-facing operations . . . you reduce machine time and scrap losses.

You can now get Crucible Hollow Tool Steel Bars in any of the famous Crucible tool steel grades, in virtually any I.D. and O.D. combination. And you can get immediate delivery from stock of the five most useful grades — KETOS oil-hardening . . . SANDERSON water-hardening . . . AIRDI 150 high-carbon, high-chromium . . . AIRKOOL air-hardening . . . NU DIE V hot-work tool steels.

Your Crucible representative can quickly show you how Crucible Hollow Tool Steel Bars will save you work and money. *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE

first name in special purpose steels

Crucible Steel Company of America

For more data circle 468 on Reader Service Card

March, 1956

modern machine shop 213

ASTE Exposition . . .

feature is particularly advantageous for production boring operations where it is necessary to move boring tools in and out of the toolholder and maintain bore diameters to unusually close tolerances.

The Flash-Change tooling system includes a comprehensive range of stand-

ard boring bar sets and a full complement of adapters for drilling and milling operations.

For more data circle 23 on Reader Service Card

★ ★ ★

15-TON SAFETY PUNCH PRESS

In Booth No. 618, Kenco Mfg. Co., 5211-A Telegraph Rd., Los Angeles 22, Calif., will introduce the Model 15 15-

Ton "Electro-Safe" Press which is designed to fill the growing need for foolproof press safety features, as well as to offer extended high production versatility and low cost maintenance. In operating the press, the operator must depress two widely-spaced buttons at the same time to single-trip the press, keeping both hands occupied.

FLEXIBILITY OF A THOUSAND POSITIONS

Light as you want it for
Machine tools, assembly,
inspection.

\$7.90
EACH

in std.
pkg. of 4
List \$9.30 ea.

MODEL 55-BH-701

NEW Universal Arm Joints — Bend 150°. Large frictional triple disc bearing surface. Smooth, easy movement. Instantly adjustable by hand to direct light exactly as needed.

NEW Collar Disc Joints — Rotate 180°. Combination of 135° bend joints and 180° rotating joints provides amazing articulation for positioning reflector.

NEW Reflector — Deep pear shape design with 5" x 3 3/4" orifice. Accommodates 100 watt A-21 or smaller lamp.

NEW Base — Universal for horizontal or vertical mounting. Outlet box base optional.

NEW Wiring — Heavy duty Levovier switch socket interior in high impact plastic shell with Velumoid lamp seal. 8 ft. SPT-2 18/2 heavy duty plastic rip cord with molded plug.

NEW Finish — Semi-gloss Vista Green baked enamel. Reflector interior, high temperature White.

Also
Available
with
one arm

WRITE for Complete
Catalog of Localite
models for every
industrial use.



THE FOSTORIA PRESSED STEEL
CORPORATION, Fostoria, Ohio

Localities are available through
wholesalers everywhere.

For more data circle 469 on Reader Service Card



Kenco Model 15
"Electro-Safe" Press



NEW
ABRASIVE SCREEN
MADE WITH AVISCO RAYON
OUTLASTS ORDINARY
DISCS 7 TO 15 TIMES

Working with The Carborundum Company, American Viscose helped develop a revolutionary sand screen to replace conventional abrasive discs. It has a useful life 7 to 15 times greater for two reasons: First, the removed material flows out through the open mesh. Second, it is made from Avisco filament rayon yarn that stays "young and muscular" even when loaded with phenolic resins and abrasives. The result is an abrasive far more useful to you.

American Viscose Corp.
350 Fifth Avenue, New York 1, N.Y.



AVISCO

America's Greatest Industries Grow with **AVISCO®**
For more data circle 470 on Reader Service Card

ASTE Exposition . . .

The flywheel is eliminated. In single-stroke operation, the press and motor go dead after the stroke, eliminating stored-energy, double-tripping hazards. The selector switch, which sets the press for single-trip, continuous and other types of operation, is locked in position by authorized

personnel so that the operator cannot "fudge" or devise dangerous shortcuts by varying the setting. The absence of standard clutching operation eliminates loud noise. The press is equipped with a heavy-duty safety brake which will apply at any time the power is disconnected or disrupted. The safety stop button will stop the press instantaneously regardless of the point reached in the cycle. One important objective of these safety features is to provide a punch press which will not operate unless the operator is free from danger.

Besides increasing the safety of the press, Kenco has also extended its versatility. The selector switch, an electrical control, makes it possible to set the press instantly in any of several operating positions—continuous stroke, single trip, inching—with two-hand or foot control. The "inching" feature on the press permits one performing a setup or die adjustment to control the movement of the ram precisely in small or large increments by depressing control buttons. Another innovation permits the operator to start and to stop the crankshaft with the throw in

**SCHAUER
SPEED LATHES**
"work rings around"

**OTHER
SECONDARY
FINISHING
METHODS**

Stoning hardened
steel ring with
Schauer Type NA28
Speed Lathe.

These versatile, low-cost machines provide the fastest, most economical method of filing, deburring, polishing or lapping metal and plastic parts. There's a Schauer Speed Lathe to solve practically any secondary finishing problem. Many sizes and models with holding devices to suit the job. *Speed your production* with Schauer Speed Lathes. Write for Catalog No. 530.

See Schauer Speed Lathes at the ASTE Industrial Exposition, Booth No. 152, International Amphitheatre, Chicago, March 19-23.

SCHAUER MANUFACTURING CORP.

4501 Alpine Ave. • Cincinnati 36, Ohio

For more data circle 471 on Reader Service Card

NEED HELP

In Cutting Holding Tool Costs?

SEE US AT BOOTH 1500,
ASTE EXPOSITION,
MARCH 19 - 23

SEIBERT SHUR-LOCK ADJUSTABLE ADAPTERS

● Better production machining methods at Seibert today make it possible to manufacture, in quantity, holding tools of improved quality without increased cost to you. The Seibert Shur-Lock adjustable adapter is one illustration. They are manufactured to precision tolerances from the highest quality hardened alloy steel, to give you the best in holding tools — certain to cut set-up time and give long service life. In addition, they are produced more efficiently than ever before which makes it possible to supply your needs promptly and at reasonable cost. Quality, Service and Price are the three reasons hundreds of users are today specifying Seibert tools. It will pay you to investigate the advantages of standardizing with Seibert.

WRITE TODAY FOR FREE ADAPTER BULLETIN AND LATEST PRICE LIST

Drop us a line today and ask for Folio 2-50 and a Price List — or, ask to have a Seibert representative call at your plant soon to check over your tooling problems. There's no obligation.



Precision ground threads
for accurate adjustment



Shur-Lock
Adapter
Bodies



Shur-Lock
Micro-Nuts



Shur-Lock
Tension and
Compression
Tap Drivers



Spindle
Extension
Adapter
Assemblies



SEIBERT & SONS, INC. CHENOA, ILLINOIS
Quality MULTIPLE DRILL SPINDLES AND PRODUCTION TOOL[®]

For more data circle 472 on Reader Service Card

ASTE Exposition . . .

any desired position before or after "top-dead-center." This advantage is made possible by cam action and a limit switch.

According to the manufacturer, the press can single stroke as many as 60 times per minute. Recommended continuous operating speeds, which may be obtained by changing the ratio of

the motor speed to the final drive, range from 20 to 200 strokes per minute. Fewer or more strokes may be obtained for special work.

For more data circle 24 on Reader Service Card

★ ★ ★

QUICK-CHANGE TOOLS AND MILLING CUTTERS

Beaver Tool & Engineering Corp., Box 429, Royal Oak, Mich., will have its engineers in

Booth No. 444 to show how Beaver quick-change tools reduce down time losses for changing of cutting tools. The display will include an installation of a quick-change holder in a machine spindle as visual proof that the holder does not impair the accuracy of any machine tool. Also exhibited will be the new line of Eager Beaver Milling Cutters which are designed for fast removal of stock and unusual finish due to ample

GREEN adjustable-grip

MASTER FEED FINGER

GRIPS ANY SIZE OR KIND OF BAR STOCK

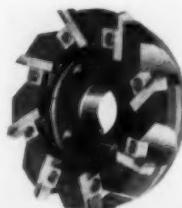
without scratching or scoring!

- Synthetic rubber inserts protect bar stock from scratching or scoring.
- Tension is uniform... prevents distortion when thin-wall tubing is used.
- Simple construction eliminates maintenance. Only four parts... outer sleeve, rubber insert, tension sleeve and combined locking nut and feed tube adapter.

Write for illustrated descriptive literature.

GREEN MANUFACTURING CO.
122 S. PRAIRIE AVE. • ROCKTON, ILLINOIS

For more data circle 473 on Reader Service Card



Eager Beaver Carbide Milling Cutter

for { —greater confidence in gaging results
—continuous uniformity of production
—lower gage costs per piece inspected

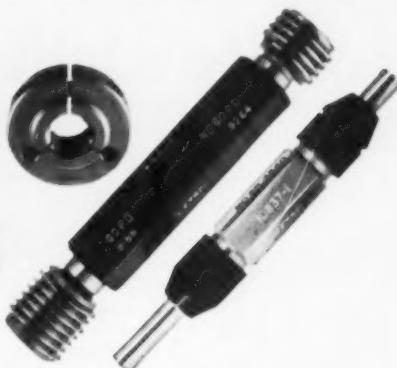
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GAGES

Quality-Built to

STAY ACCURATE LONGER



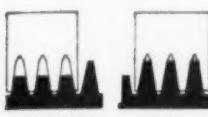
Micro-Lapped Finish

keeps gages accurate longer by reducing wear. No sharp "hills" and "valleys" to wear quickly and reduce gage accuracy.

Extra Clearance at root of ring gages permits wear correction.



Truncated Thread Form



of thread plug at no extra cost. Enables accurate setting and permits easy check for gage wear.

Convolution of First Full Thread

on thread plug and ring gages removes sharp scoring edges and prevents chipping. Also makes Besly-Metro Gages easier to use.



Visit Booth 637
ASTE Industrial Exposition
CHICAGO—MARCH 19-23

BESLY-WELLES CORP.

Established as Charles H. Besly & Co. in 1875

108 Dearborn Avenue • Beloit, Wisconsin

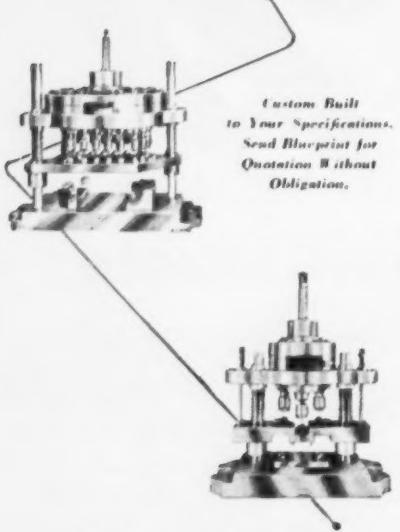


For more data circle 474 on Reader Service Card

FOR MULTIPLE DRILLING OF HOLES
ON PRODUCTION RUNS . . .

ERRINGTON

FIXED CENTER DRILLING HEADS
with JIGS and FIXTURES



Do more . . . and do it better with Errington Fixed Center Drilling Heads. They drill any number of varied size holes on different elevations. The head has grooved thrust ball bearings at all thrust points and hardened bronze radial bearings. Heat treated spindles and gears, of one piece turned from solid bar stock. It is geared approximately 2:1. All enclosed in a sand-cast aluminum case and cover, with alemite pressure lubrication.

Send for Complete Catalog

ERRINGTON Mechanical Laboratory, Inc.
Established 1891

Main Office and Plant: STATE ISLAND 4, NEW YORK

708 Waukesha St., Madison 10, Wis., U. S. A.
For more data circle 475 on Reader Service Card

ASTE Exposition . . .

chip clearance and proper angle of blades. Fast, accurate blade changes and adjustment are other features of the milling cutters. All types of ferrous and non-ferrous metals may be milled with the shell end mill and face milling cutters by changing the blades to the proper grade of carbide.

For more data circle 25 on Reader Service Card

★ ★ ★

ELECTRIC HIGH SPEED STEEL HARDENING FURNACE

The Sentry Co., Foxboro, Mass., will feature the latest Size No. 2 Model "Y" Electric High Speed Steel Hardening Furnace in Booth No. 284. This



Sentry Size 2 Model "Y" Electric Furnace

For automatic metal-cutting . . .

Use CIRCLE R CARBIDE SAWS

For controlled quality in automated production, especially where extra tough cutting prevails, Circle R Carbide Saws are your reliable choice. The best you can buy, yet costing no more, they ensure longer runs, less down time, fewer stoppages for re-sharpening. Comparative records prove they greatly increase production rates. Refer to our Catalog N for an inclusive line, both carbide tipped and solid tungsten carbide.

Controlled quality in automated production

Consult CIRCLE R Specialists in —

BURBANK
CHICAGO
CLEVELAND
DAYTON
DETROIT

HACKENBACH
INDIANAPOLIS
KANSAS CITY
MILWAUKEE

NEW YORK CITY
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MONTREAL
PHOENIX

PITTSBURGH
PROVIDENCE
ROCHESTER
ST. LOUIS
WESTBURY, L. I.



CIRCULAR TOOL CO., INC.

PROVIDENCE 5, RHODE ISLAND

Specialists in Circular Cutting Tools Since 1923

For more data circle 476 on Reader Service Card

March, 1956

modern machine shop 221



METAL SLITTING SAWS
COPPER SLITTING SAWS
SCREW SLOTTING SAWS
COMMUTATOR SLOTTING SAWS
JEWELERS SLOTTING SAWS
CUT OFF SAWS • CIRCULAR
KNIVES & ROTARY SHEAR
BLADES • CIRCOLOY STEEL
SAWS • SOLID & TIPPED
TUNGSTEN CARBIDE SAWS
COMBINED DRILLS & COUNT-
ERSINKS • CENTER REAMERS

ASTE Exposition . . .

furnace will be in operation throughout the show, demonstrating the hardening of molybdenum high speed steel tap blanks using the Sentry Diamond Block Method of atmospheric control to prevent scaling and decarburization during hardening. The facilities will also be available for the hardening of sam-

ple tools brought in by interested visitors. The booth will be manned by a staff of experienced men.

For more data circle 26 on Reader Service Card

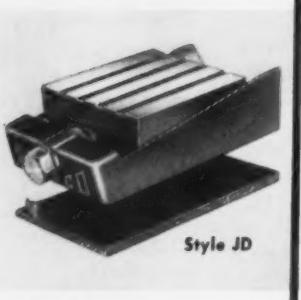
★ ★ ★

TURRET DRILLING AND TAPPING MACHINE

In Booth No. 575, Howe & Fant, Inc., 29 Fitch St., East Norwalk, Conn., will display the latest model of its turret

drilling and tapping machine equipped with a newly designed universal jig base. The jig base, never before exhibited, makes possible rapid and accurate positioning of work under the H&F turret spindles, all of which work on a common axis. According to the manufacturer, the base affords savings on handling time and down

DEPENDABLE MACHINE SUPPORT!



Style JD



Style JS

With

EMPCO

LEVELING JACKS

For better machine performance set your machines level and keep them level! That's the key to increased production with less maintenance! EMPCO Leveling Jacks provide a solid, adjustable support for machine tools, large surface plates, tool room, and production equipment of all types. Easily installed and located, EMPCO Jacks keep your equipment level and

stable—keep maintenance at a minimum.

VI-SORB Mounting Pads, optional with EMPCO Jacks, control vibration from within the machine itself and reduce transmitted vibrations. Available in six styles and 25 models there's a EMPCO Jack and VI-SORB Mounting Pad for your every machine leveling requirement!

WRITE TODAY FOR ILLUSTRATED BULLETIN AND PRICES!

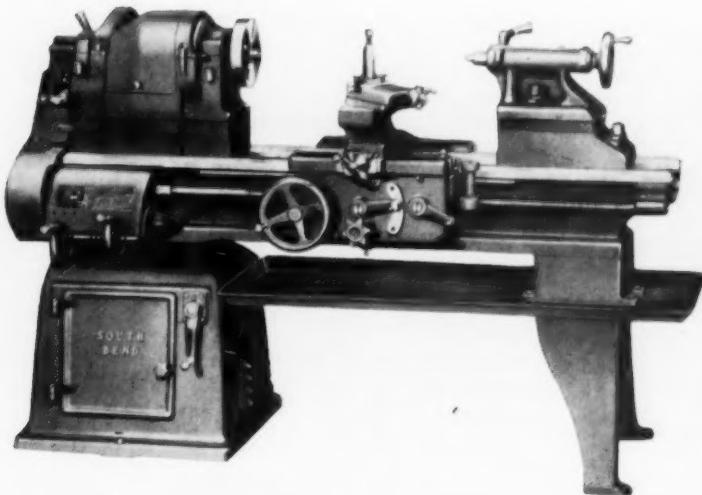
THE ENTERPRISE MACHINE PARTS CORPORATION
2715 JEROME AVENUE • DETROIT 12, MICHIGAN

For more data circle 477 on Reader Service Card



H&F Turret Drilling
and Tapping Machine

SOUTH BEND 16-24" LATHE



CAPACITY for Big Jobs! ACCURACY for Any Job!

Here's a lathe with a versatility that makes equipment dollars go further. Its 24" swing provides the capacity for handling a variety of large diameter, medium-weight jobs whose size would otherwise require large, heavy lathes. This extra capacity is achieved without any sacrifice of efficiency in the machining of smaller work. Having an unusually wide range of spin-

dle speeds, all sizes of work can be machined at effective cutting speeds. The improved South Bend two lever gear box permits instantaneous selection of power feeds for any turning, facing, or thread cutting operation. A complete line of chucks, tools and attachments simplifies tooling the lathe. Write for catalog describing this versatile South Bend lathe.



PLEASE SEND INFORMATION CHECKED:

- | | | | | | | |
|--|---|--|---|--|---|---|
| <input type="checkbox"/> 9" and 10" BENCH LATHES | <input type="checkbox"/> 10" to 16-24" FLOOR LATHES | <input type="checkbox"/> DRILL PRESSES | <input type="checkbox"/> 15" & 17" Collet TURRET LATHES | <input type="checkbox"/> TOOL GRINDERS | <input type="checkbox"/> 7" BENCH SHAPERS | <input type="checkbox"/> MILLING MACHINES |
|--|---|--|---|--|---|---|

Name _____ Street _____
City _____ State _____

Building Better Tools Since 1906 • SOUTH BEND LATHE • South Bend 22, Indiana

For more data circle 478 on Reader Service Card

ASTE Exposition . . .

time for sharpening tools, and rejects are virtually eliminated.

The machine features consecutive drilling and tapping with unusual speed and precision on a wide range of jobs. Up to six different operations, in any desired sequence, can be completed with only one handling of the work-piece. Individual spindle speeds, depths and reversals for tapping are preset

and repeat automatically as the turret is indexed during successive cycles. Setup is fast and simple, requiring no special tools.

For more data circle 27 on Reader Service Card

★ ★ ★

Fixture Clamps And Fixture Details

In Booth No. 756, Harco Engineering, 12092 Woodbine Ave., Detroit 28, Mich., will display its complete line of

fixture clamps and fixture details. The fixture clamps include center cam, end cam, end hand knob, center hand knob, acorn nut, plain nut and hook clamps. The fixture details include rest buttons, jig buttons, clamp rests, locating pins, fixture keys, swivel screws, dog point screws, knurled head screws, quarter-turn screws, one-half turn screws, T-slot nuts, acorn nuts, coupling nuts, flange nuts, knurled nuts, plain washers, spherical washers, C-washers, eye bolts, wing bolts, jig legs, hand knobs, hand-wheels, single and double cams as well as alloy steel studs.

The exhibit will also include



STANDARD

SUPER-PRECISION

Spindles

LEAD THE

WAY IN

INDUSTRY!

Makers of
more than 800
different
Super-Precision
Spindles for
ORIGINAL
EQUIPMENT

MANUFACTURERS,

REBUILDERS

AND USERS

SINCE 1912



MADE IN U.S.A.
STANDARD METALWORKING
THROUGHOUT THE WORLD

STANDARD Super-Precision Spindles represent the ultimate in rugged construction, trouble-free maintenance and adaptability. In use on a thousand jobs in industry the nation over. Every Standard spindle is "checked out" electronically in our sound-, vibration-, dust-proof laboratory before approved for delivery. Write today for catalog.

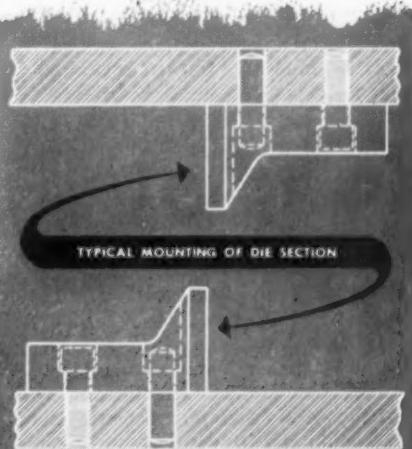
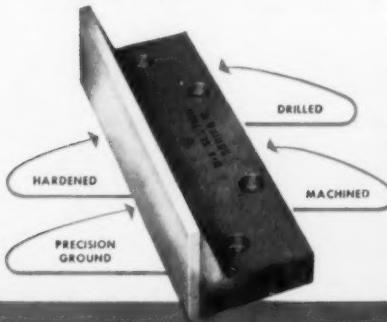
Visit us • Booth 830 • ASTE Show
Chicago Amphitheatre • Mar. 19 - 23

the **STANDARD** electrical tool co.

SUPER-PRECISION SPINDLE DIVISION
2487 RIVER RD. • CINCINNATI 4, OHIO

For more data circle 479 on Reader Service Card

Reduce Your Die Building Time...



R-B Standardized Die Sections

Standardized Die Sections manufactured by R-B eliminate all of your machining, drilling, hardening and grinding. For, these die sections are entirely prefabricated and ready for mounting on your die shoes . . . they will substantially reduce your die building time.

Series A, B & C die sections have cutting edges of tool steel which are hardened and precision ground. Bases are of mild steel to permit drilling of dowel pin holes.

Series AA, BB & CC die sections are not hardened, have wider lands and are of the same general construction as series A, B & C. These extra wide lands permit contouring before hardening. Die sections in both series are available in various lengths and heights.

TOOL STANDARDIZATION IS THE BASIS FOR SAVING PRODUCTION TIME. WITH R-B YOU GET THE ACCEPTED STANDARD OF THE SHEET METAL INDUSTRY—IN STANDARD DESIGN FEATURES THAT SAVE IN ENGINEERING, DIE CONSTRUCTION AND OPERATION.

RICHARD BROTHERS PUNCH DIVISION ALLIED PRODUCTS CORPORATION

Dept. 81 • 12625 Burd Rd. • Detroit 23, Michigan

Please send me additional information.

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____



ALSO PRODUCED IN OTHER ALLIED PLANTS

SPECIAL COLD-FORGED PARTS

FERROUS POWDERED METAL PARTS

STANDARD CAP SCREWS

PRECISION GROUND PARTS

SHEET METAL DIES
MADE OF FERROUS ALLOYS,
ZINC ALLOYS OR PLASTICS

For more data circle 480 on Reader Service Card

ASTE Exposition . . .

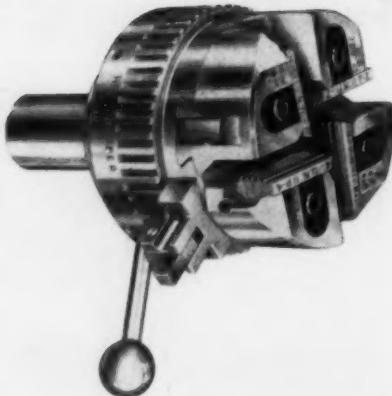
Techni-Tool Products, consisting of spring plungers, three-piece spring plunger, reamed hole fixture keys, toggle pads and jack locks.

For more data circle 28 on Reader Service Card



HARDENED AND GROUND DIE HEADS

In Booth No. 578, Landis Machine Co., Waynesboro, Pa., will feature "Landmatic" Hardened and Ground Die Heads which have been redesigned and now feature a "rapid-change" size adjusting mechanism. In addition to permitting rapid size adjustments, the new mechanism provides precision movement and positive locking action. It consists of a pivoted latch which is held in engagement with notches on



Improved "Landmatic" Hardened and Ground Die Head with size adjusting mechanism

the adjusting ring by spring tension. To adjust the head, the latch is simply depressed and the adjusting ring is rotated manually by the required

A black and white photograph showing two cylindrical BYCO tap bushings in the foreground, one standing upright and one lying horizontally. Behind them is a box labeled "BYCO TAP BUSHING". Below the box is a detailed technical illustration of a tap bushing assembly, showing its internal structure with a central threaded rod and a locknut.

BYCO TAP BUSHINGS

Give Higher Quality Threads

- ... Less Tap Breakage
- ... Less Tap Wear

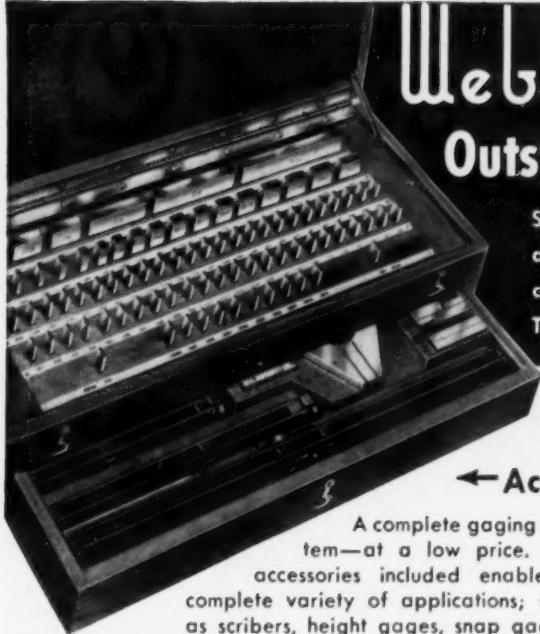
BYCO tap bushings have a square broached end to fit and drive all standard taps from No. 0 to 1 $\frac{1}{2}$ " and pipe taps from $\frac{1}{8}$ " to 1". Bushings are available in five o.d. sizes to fit $\frac{1}{2}$, $\frac{5}{8}$, 1, $1\frac{1}{4}$ and $1\frac{1}{2}$ in. tap holders. Chrome hardened for long life. Self-centering screws on each side of bushing lock tap securely and assure absolute true positioning.

Write today for Bulletin MS

BYCO INDUSTRIES

2302 E. 31st St.
MINNEAPOLIS 6, MINN.

For more data circle 481 on Reader Service Card



Webber Presents Outstanding Values

Standard Steel gage blocks
at prices which any shop
can afford. Top quality.
Typical Webber values.

84 Block Set Standard Steel with ← Accessories

A complete gaging sys-
tem—at a low price. The
accessories included enable a
complete variety of applications; such
as scribes, height gages, snap gages,
plug gages—all have the famous Webber
accuracy. Size range .050" to 4.00".

**Set 84 B, with
Accessories,
± .000008",
\$470**

**84A, with Accessories,
± .000004", \$545**



82 Block Set **CROBLOX**

(Solid Chrome Carbide)

Most durable, and economical
gage blocks. Diamond hard—Croblox
remain accurate year after year,
reduce production costs. Corrosion resistant.

Accuracy ± .000008", Only **\$895**

Webber GAGE COMPANY

12899 Triskett Rd. • Cleveland 11, Ohio

LARGEST EXCLUSIVE MANUFACTURER OF PRECISION GAGE BLOCKS

For more data circle 482 on Reader Service Card

ASTE Exposition . . .

amount. The notches are positioned on the adjusting ring so that a movement of one notch will provide a corresponding movement of 0.0005 inch on the pitch diameter of the workpiece.

The heads are stationary, self-open-

**unique in design —
rugged in construction**

GREEN PANTOGRAPH ENGRAVERS

THE FAMOUS MODEL 106



THE NEW HEAVY-DUTY MODEL D-2



The three-dimensional bench Model 106 cuts, costs — engraves, routes, models and profiles, giving you expert results even by unskilled workers.

The Model D-2 two dimensional heavy-duty Panto-graph is a precision machine with a multitude of new features. Open on three sides, it permits complete freedom for engraving, milling, profiling large panels (up to 30" in diameter) or bulky pieces. Single, micrometer adjustment controls vertical depth of cut, automatically adjusting copy table with pantograph. Range of reduction ratios from 2-to-1 to infinity! Vertical range over 10 inches!

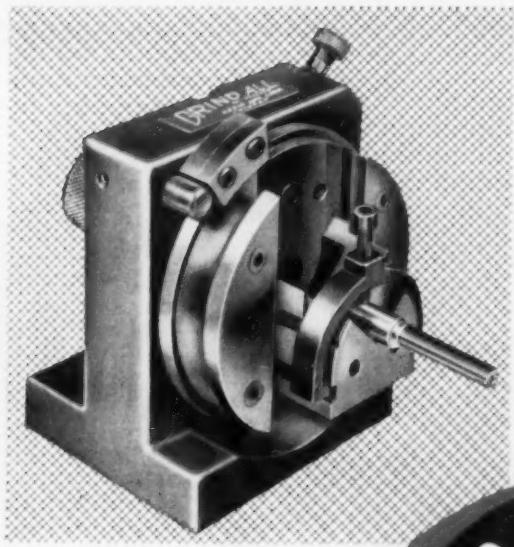
For complete information, write to

GREEN INSTRUMENT COMPANY
392 Putnam Ave. **Cambridge, Mass.**

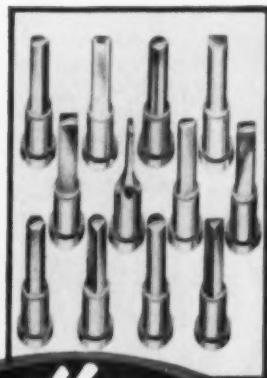
See us at Booth 243 Instruments Ave. at the IRE Show
For more data circle 483 on Reader Service Card

ing (pull-off) die heads, designed primarily for application to turret lathes. They are available in four sizes—the $\frac{5}{8}$ -inch head with a No. 4 to $\frac{5}{8}$ -inch range; the $\frac{7}{8}$ -inch head with a No. 4 to $\frac{7}{8}$ -inch range; the $1\frac{1}{4}$ -inch head with a $3/16$ to $1\frac{1}{4}$ -inch range; and the 2-inch head with a $\frac{3}{8}$ to 2-inch capacity. These heads can be used for either right or left-hand threading with the use of right or left-hand chaser holders. No other head changes are necessary, and the same chasers may be employed for both right and left-hand work by merely grinding the proper cutting angles at both ends of the chasers. These tangential chasers may also be used to thread all diameters within the range of the head, providing the pitch and the thread form remain constant.

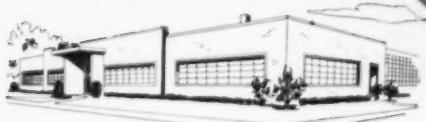
The featured new tooling development by Landis will be the adaptation of the "Land-roll" Thread Rolling Attachment for tapered threading. Originally designed for straight thread rolling only, the unit can now be used for either straight or tapered rolling through the use of proper thread rolls



Perforator Grinding
 $\pm .0002$ with greatest speed
accuracy and range



*made by the house
that precision built*



*Headquarters for the Finest ...
Precision Tools*

Consult our engineering
staff when you need
precision tools or dies.
Send for free catalog.



**the
Grind-All
Fixture**

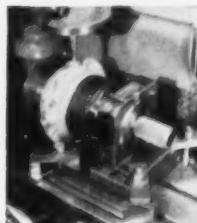
Here is higher accuracy, greater range and maximum speed in grinding perforators. Meets the requirement for a more versatile perforator grinding attachment. Grinds many irregular shapes concentric with shank.

Also performs other functions such as light milling and boring fixture, inspection tool, etc.

Harig

Manufacturing Co.

1700 W. HOWARD ST., CHICAGO 31



BORING FIXTURE



INSPECTION TOOL

For more data circle 484 on Reader Service Card

ASTE Exposition . . .

and thread roll equipment. Also to be displayed is a new line of "Landex" Type LLL Hardened and Ground Die Heads which are primarily designed for application to automatic screw machines. These compact heads feature a new latching mechanism which enables greater overall die head rigidity and assures trouble-free operation. The

head now has fewer moving parts, and the latching surfaces have been increased for greater distribution of wear.

For more data circle 29 on Reader Service Card

★ ★ ★

CUTTING COOLANT

In Booth No. 1021, The Cutting Tool Mfg. Division of The Motch & Merryweather Machinery Co., 1250 E. 22nd St., Cleveland 17, Ohio, will feature

"Triple C" Cutting Coolant which is said to be clear, cool and clean. The coolant is non-gumming, non-galling and anti-rust. Extreme pressure lubricity provides for long tool life; friction is minimized. The cutting coolant is water soluble, non-oily and non-greasy. It is not subject to the development of any foul odor. Workpieces do not become slippery. "Triple C" cutting coolant is said to eliminate all fire hazards and is smokeless and foamless. Its vapor is harmless and there is no danger of skin infection.



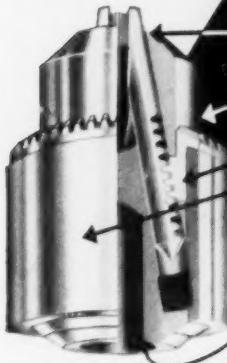
Efficient—low cost—compact MISTKOP vapor collectors can be quickly installed and easily maintained, wherever collection and control of industrial vapors are necessary. MISTKOP vapor collectors save costs in recovered coolants—keep walls, windows, ceilings clean of excess moisture—eliminate fire hazard from uncontrolled vapor. There is a MISTKOP collector to meet your requirements. Write for illustrated folder today.

ALSO A COMPLETE LINE
OF DUST COLLECTORS

AGET MANUFACTURING COMPANY
1398 EAST CHURCH ST., ADRIAN, MICH.

For more data circle 405 on Reader Service Card

Here are the points . . .



- Jaws Nickel Chrome Moly Alloy Steel.
- Key Holes: do not extend into body cavity thereby sealing out dirt.
- One Piece Geared Nut Construction.
- Entire Chuck Body Hardened inside and out.
- Taper Bore hardened and ground.

Chucks and Keys interchangeable with other makes.

. . . that make

Quality Supreme Chucks

BRAND

Every chuck is individually checked for accuracy . . . you can depend on Supreme Chucks for trouble-free performance and long wear.



SUPREME PRODUCTS, INC.

2222 S. CALUMET AVE., CHICAGO, ILLINOIS

the chuck that lives up to its name . . . SUPREME

For more data circle 486 on Reader Service Card

ASTE Exposition . . .

and Shell End Mills, ranging from 3 to 32 inches in diameter; "Triple-Chip" Segmental Saw Blades, the largest being an 84-inch diameter blade for cutting off metal; "Triple-Chip" Solid Saw Blades for metal cutting; "Triple-Chip" Slitting and Slotting Saw Blades ranging from 3 through 8 inches in diameter.

ter; and "Dual Drive" Adapters, used in slitting and slotting operations for maximum protection to the blades.

For more data circle 30 on Reader Service Card

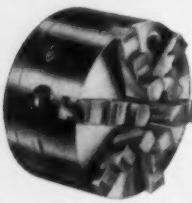
★ ★ ★

IMPROVED DIE STEELS AND IDEA-RAMA

A wide range of new ideas and information on specialty steels will be

presented by The Carpenter Steel Company, Reading, Pa., in Booth No. 1310. Carpenter will stage an Idea-Rama, which is designed to give visitors a fresh approach to lowering tool and die costs, improving their products and increasing productivity. Highlights of the display include the first showing of an improved die steel developed especially for cold heading, first news of an improved manganese oil-hardening die steel, and the premier showing of a new 28-minute color slidefilm entitled "Four Steps To Better Tools and Dies."

compare **HORTON** Tru-Set FEATURES



- Repetitive accuracy to .0002" T.I.R. guaranteed
- Rugged Meehanite bodies guaranteed for life
- Instant peripheral location - 3 operating pinions
- Available up to 12" in both 3 and 6 jaw styles
- Packed in reusable airtight metal containers

compare **HORTON** Tru-Set PRICES

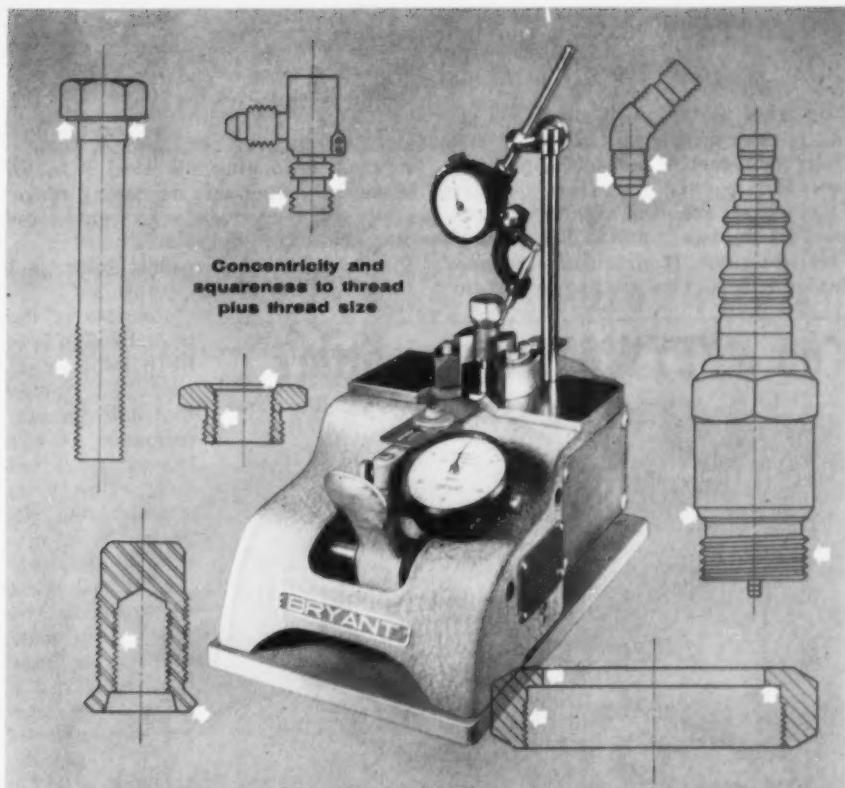
| SIZE | MODEL | NET PRICE |
|------|-------|-----------|
| 5 | 5T6 | 86.35 |
| 6 | 6T6 | 120.65 |
| 8 | 8T6 | 167.65 |
| 10 | 10T6 | 247.65 |
| 12 | 12T6 | 298.45 |

Chucks listed above are 6 jaw universal type with two sets of jaws. See your Horton Distributor or write direct for new Net Price Selector



HORTON CHUCK
WINDSOR LOCKS, CONN.

For more data circle 487 on Reader Service Card



You can check all these with a Bryant Gage!

These are just a few of the checking problems that Bryant

Gages can solve — accurately and quickly. For a prompt solution to your checking problem, mail the coupon below.

AT THE A.S.T.E. SHOW — BOOTH NO. 901

Bryant Gage and Spindle Division P. O. Box 620-D Springfield, Vermont, U.S.A.

Gentlemen: I am enclosing a print of my part. Please send me a quotation. Please send literature and prices on the complete line of Bryant Gages. Please have Bryant representative call.

Name _____

Street _____

Title _____

City _____ Zone _____

Firm _____

State _____

For more data circle 488 on Reader Service Card

ASTE Exposition . . .

quenching alloy known as H-9 Double Header Die Steel. Made by specially refined steel mill techniques, the new H-9 is said to solve problems of cracking, splitting, spalling, excessive die replacements and unpredictable die costs. It provides a tougher center because of a sounder, more uni-

form grain structure. The H-9 Double Header steel is recommended for dies larger than 1½ inches in diameter. It is also designed for inserts, insert holders, coining dies, knurls and so on.

Carpenter will also show a manganese oil-hardening die steel with an expanded, super-safe hardening range. Allowable temperatures go from as low as 1,425 to 1,525 degrees F. In addition, the steel has easy machinability and unusual dimensional accuracy.

Purpose of the new slidefilm is to help tool engineers get better tool and die performance at the lowest possible cost. The four step formula visualized in the film calls for designing the tool or die right, using the right steel, making it right and heat treating it right. In presenting the matter of tool and die design, the film reviews the causes of unequal heating and cooling and strain lines. Then it prescribes the appropriate remedies. Selecting the right steel is covered in terms of service, heat treating, size change and desired characteristics in the finished tool. The section on making the tool right deals with the need for

Can a KEYWAY cost so little?



Yes indeed!

Using a Minute Man Keyway Broach Kit, you can cut keyways for as little as a penny a piece in just one minute. For keyways from $\frac{1}{16}$ " to 1" in any bore from $\frac{1}{4}$ " to 3".

Minute Man Broaches for square and hexagonal holes and Production Type Keyway Broaches are also available from stock at your Industrial Distributor's.

The duMONT CORPORATION, Greenfield, Mass.

MAIL FREE BROACH CATALOG AND PRICE LIST S describing 26 standard kits, 49 standard broach sizes, 59 standard bushing sizes and a wide range of SPECIAL BROACHES to

Name.
Company.
Address.

BOOTH 1106 — A.S.T.E. SHOW

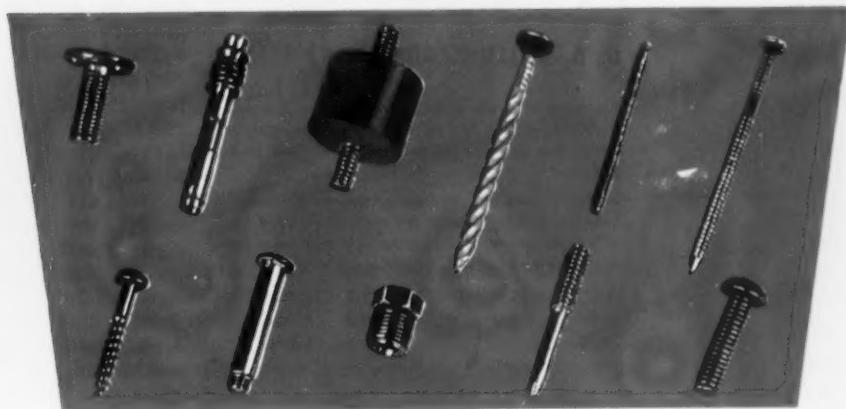
For more data circle 489 on Reader Service Card

Prutton

THREAD
ROLLING
MACHINERY

HOW TO BREAK ALL PREVIOUS PRODUCTION AND COST RECORDS ON YOUR THREADED PARTS!

Prutton, Exclusive Planetary Die System, Thread Rolling Machines with high-volume hopper feed are breaking all records (UP TO 50,000 PCS. PER HOUR) on thread rolling, roll forming, knurling, marking, serrating and necking.



For instance, on the typical threaded and formed parts shown above, Prutton Thread Rolling Machines are setting unprecedented records such as 9,000 Tubing Nuts per hour; 6,000 Speedometer Worms per hour; and up to 25,000 pcs. of various Threaded Bolts, Screws, Hollow Work Parts, Wood Screws, and as high as 50,000 nails per hour.

Let us demonstrate how Prutton superiority can work for you. Submit your parts for our recommendations. No obligations, whatsoever.

Prutton Corporation

5298 WEST 130th ST.

CLEVELAND 30, OHIO

For more data circle 490 on Reader Service Card

ASTE Exposition . . .

smooth, accurate machining, avoiding rough machine lines, light stamp marks and the need for bar bark removal. Exhaustive service information follows on proper heat treating techniques. Actual cases are shown to illustrate the savings and improved service obtainable by observing the four steps.

In addition, Carpenter will have on display a complete library of service data on its full line of specialty steels. For more data circle 31 on Reader Service Card

★ ★ ★

MULTIPLE HEAD, CONVEYOR-TYPE GRINDER

Designated as the Model 680, a multiple head, conveyor-type abrasive belt grinder will be featured in Booth No. 1221 by The Engelberg Huller Co., Inc., 102 Seneca St., Syracuse, N. Y. The machine is designed for wet or dry grinding and polishing of ferrous and non-ferrous metals, plastic and other materials. It is said to be especially suitable for grinding and deburring flat surfaces of these materials on a high production basis. Multiple heads permit a simultaneous series of operations in the same time as a single operation, with no added labor. Unmachined parts can be processed with progressively finer belts to give a sized, uniform finish down to fine polishes.

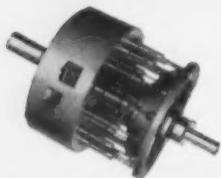
The conveyor belt on the ma-



For automatic setup.



For semi-automatic setup.



For semi-automatic setup.

Heads... You Win!

U. S. DRILL HEADS, THAT IS!

Regardless of the size of your shop, if you have high production jobs, you'll find an extraordinary reduction in tooling and manufacturing costs when you use U. S. Drill Head.

The heads shown here, moderate in cost, are for use with automatic chucking machines and turret lathes, for drilling or tapping operations. They provide, in most cases, that a part can be completely finished in one handling.



Manufacturers of all types of adjustable, fixed center and individual lead screw tapping heads.



THE UNITED STATES DRILL HEAD COMPANY
BURNS STREET • CINCINNATI 4, OHIO

For more data circle 491 on Reader Service Card

MEMO:

TO: Purchasing
FROM: Production Engineering

Tom —

With a little outside help,
I think we could ream and bore
those castings in one operation —
with gun drills.

Would you get a Chicago
Latrobe engineer in for
consultation? I hear they are best
in that field. E.T.

Much is new with gun drills.
They are being used today on a
variety of applications unheard
of a short while ago. So much
has happened — so fast — that it
has been difficult for many of
the most expert technicians to
keep fully informed. A good

place to get sound advice on the
use of gun drills in any plant is
from a Chicago-Latrobe service-
engineer. They are pioneers both
in production of finer tools and
in development of techniques
for their use. Call C-L soon . . .
without obligation, of course.

CHICAGO-LATROBE

CARBIDE TIPPED GUN DRILLS



DOUBLE CIRCLE
TOOLS

Part of the Chicago-Latrobe COMPLETE line . . . avail-
able through service-minded Industrial Distributors.

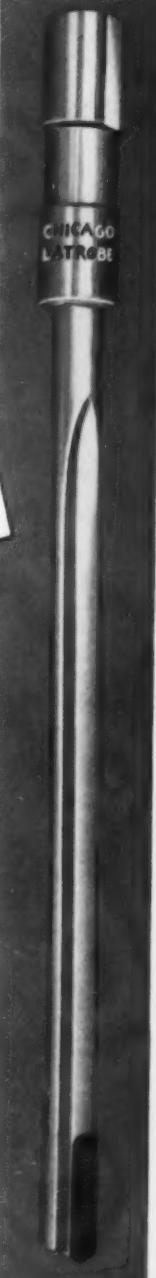
CHICAGO-LATROBE

419 W. ONTARIO ST., CHICAGO 10, ILLINOIS

DRILLS • REAMERS • COUNTERSINKS • COUNTERBORES • SPECIAL TOOLS

For more data circle 492 on Reader Service Card

Ask for Circular 200



ASTE Exposition . . .



Engelberg Model No. 680 Multiple-Head, Conveyor-Type, Abrasive Belt Grinder

chine can be changed in less than five minutes, and the belt tension is adjusted by a simple twist of the handle. Quick manual adjustment of conveyor belt speed is obtainable for settings from 5 to 30 feet per minute. Extra operator safety on the Model 680 is claimed to be assured, since the machine will not start unless the belt is tensioned. The two-head model is 90 inches long x 51 inches wide x 90 inches high, with an abrasive belt size of 6 x 80 inches. Conveyor belt size is 7 x 144

inches. Abrasive belt speed of the Model 680 is 5,500 s.f.p.m., while speed of the conveyor belt varies from 5 to 30 f.p.m. This machine has a maximum piece capacity of 4 inches high x 6 inches wide x any length. The machine is available with 5 or 7½-h.p. drives. A magnetic chuck is optional.

For more data circle 32 on Reader Service Card

★ ★ ★

HONING MACHINES AND TOOLS

Sunnen Products Co., 7910 Manchester Ave., St. Louis 17, Mo., will exhibit and demonstrate the newest developments in its precision honing machines and tools in Booth No. 474. Typical examples of parts produced on Sunnen Honing Machines will be shown, with full details of stock removal, size, surface finish and production rate. Factory representatives will supply information and answer questions about specific hole sizing problems.

For more data circle 33 on Reader Service Card

★ ★ ★

CARBIDES

In Booth No. 1318, Carboloy Department of General Electric Co., 11177 E. Eight Mile Rd., Detroit 32, Mich., will exhibit a new milling grade carbide, a new cutting tool grade carbide and the availability of a limited num-

**DYKEM
STEEL BLUE**

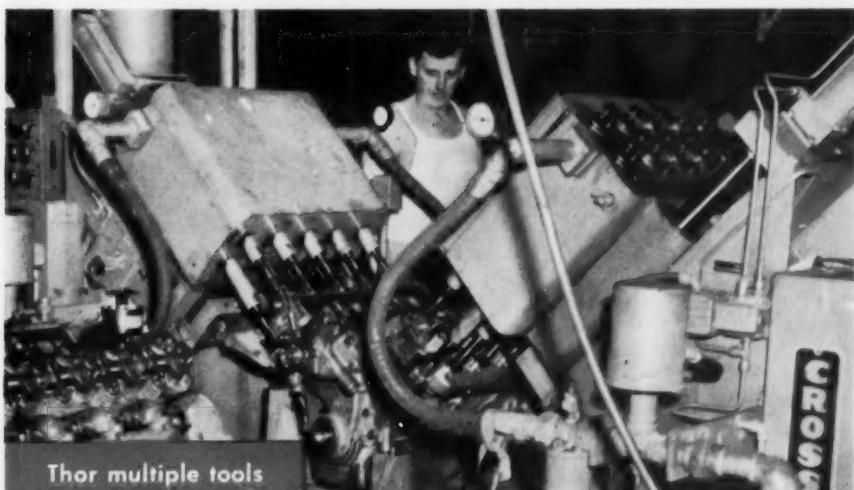
Stops Losses
making Dies and
Templates

Popular package
8-oz. can fitted
with Bakelite cap
holding soft-hair
brush for applying right
at bench; metal surface
ready for layout in a few min-
utes. The dark blue background
makes the scribed lines show up in
sharp relief, prevents metal glare.
Increases efficiency and accuracy.

Write for sample on company letterhead
THE DYKEM COMPANY
2301F North 11th St. • St. Louis 6, Mo.

For more data circle 493 on Reader Service Card

Thor Automation Tools on your job can make big cuts in labor costs



Thor multiple tools
can be custom-built to
any pattern, any number



2-Bolt Pattern



Arc-segment Bolt Pattern
(Any arc—any number of bolts)



In-Line Multiple Bolt Pattern
(Any number of bolts)



Rectangular Pattern
(Any number, any
arrangement of bolts)



Circular Pattern
(Any number, any
arrangement of bolts)

A typical example — Thor 22 unit multiple nutsetter used on
line of leading car manufacturer

Thor features assure better jobs at less cost

STALL-TYPE air regulation drives each nut to predetermined tension.

Exclusive quick-change mounting in master manifold fold permits 30 second change-over of individual units.

Easier to operate. Eliminates torque reaction at moment nuts are seated.

Air operated plunger-type push-off rods for automatic disengagement.

Handles various nut heights on one job.

Available in complete range of sizes in straight, offset or angle models.

Free design service. Thor will design and quote on a multiple nutsetter job for you without obligation. For information contact nearest Thor branch or write Thor Sales Engineering Dept., Thor Power Tool Company, Aurora, Illinois.



THOR POWER TOOL COMPANY
Branches in all principal cities

For more data circle 494 on Reader Service Card

ASTE Exposition . . .

ber of sizes of cemented oxide tool tips for testing and evaluation. Also displayed will be Carboly cemented carbide cutting tools, carbide wire drawing dies and carbide blanking, drawing, forming and piercing dies; Carboly cemented carbide blanks, toolholders, wear proofing applications, cemented

carbide tools; and General Electric vacuum melted metals, Thermistors and Thyrite Varistors.

For more data circle 34 on Reader Service Card

★ ★ ★

PRECISION SPINDLES

Several new Pope precision spindles of particular interest to tool engineers will be exhibited by Pope Machinery

Corporation's representatives, Federal Machinery Sales Co., Chicago 44, Ill., in Booth No. 392. On display will be the new Pope Super-Precision, Heavy Duty Boring Spindle, which is said to be capable of boring holes round within millionths of an inch and which comes in both belt and motor-driven types, covering a wide range of speeds and horsepower.

Additional new Pope spindles worthy of the special attention of visitors are the high-cycle, totally-enclosed, water-cooled oil-mist lubricated, motorized spindles for super-precision, heavy-duty grinding and milling at speeds up to 100,000 r.p.m. The popular and widely used Pope



PRECISION CIRCULAR CUTTERS!

Meyco carbide tipped and solid carbide cutters have earned an enviable reputation in plants where long tool life and precision workmanship is a MUST.

These cutters can be furnished in various diameters and thicknesses to meet the requirements of individual applications.

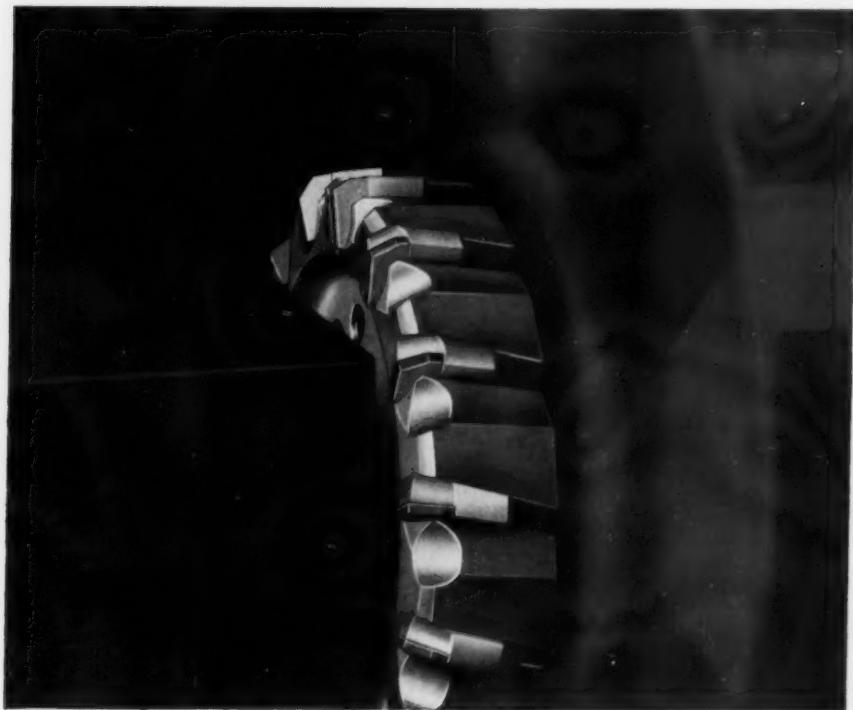
Saws and cutters, both carbide tipped and solid carbide, will aid production and precision in your slotting, venting, slitting and grooving operations . . . and they will be manufactured to your specifications. Please furnish complete specs and quantities desired when requesting prices and indicate material to be cut. Meyco experience in the manufacture of precision tools, since 1888, is at your disposal. Write for Bulletin No. 53.

ESTABLISHED 1888

W. F. MEYERS CO., INC., BEDFORD, INDIANA



For more data circle 495 on Reader Service Card



How Heppenstall's hogmill forged die blocks with facemills

Close-up made at Heppenstall's Bridgeport shows a 1500 pound, 12 x 20 x 20 inch, Hardtem B forged die block being rough milled with a 14 inch O K 9614XX, extra heavy-duty carbide insert blade facemill, incorporating 10 degree negative axial and radial rake angles. Feed, 150 surface feet per minute. Speed, 8½ inches per minute. Depth of cut, ½ to ¾; and often up to 1½ inch. Machine, a rebuilt vertical miller with 60 horsepower motor and heavy fly wheel.

IT IS THE SAME STORY EVERYWHERE. Tool engineers prefer O K carbide insert blade cutters for all kinds of tough milling operations . . . facing steel forgings, die blocks, locomotive driving rods, steel castings. There's a reason for this preference. It can be demonstrated by counting the minutes and measuring the metal removed. O K cutters are scientifically designed with various combinations of positive and negative axial and radial rake angles. Scientific designing directs the cutting forces into the body of cutter instead of transversely to the cutting edges. This is necessary because carbides have high compression strength and low transverse rupture strength.

O K cutters are the simplest, the strongest and the toughest ever built. They are heavier, huskier, with more beef in the body. The simple two-piece construction — body and blade — provides more strength and weight to better stand the heavy pull of high powered modern milling machines. Blades are wedge-shaped blocks, the wedge being the strongest mechanical device man has devised. One side of each blade is serrated. Matching serrations are cut into the body. Blades are self-locking, cannot tip or slip. No pins, screws, gibbs or locks are needed. To compensate for wear, blades are stepped out one serration and reground. A new set of blades gives you a new cutter. Put your milling problems up to our tool engineers. Write for Catalog 13.

Visit our Booth 633 • ASTE Show

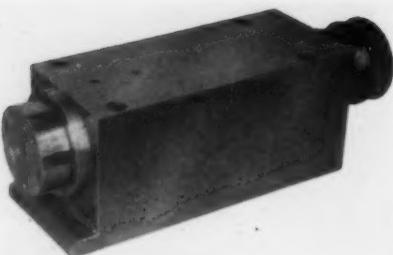
**modern milling cutters
for modern milling machines**

THE OK TOOL CO., INC., Milford, New Hampshire

For more data circle 496 on Reader Service Card

ASTE Exposition . . .

motorized 1-h.p., 3,600-r.p.m., totally-enclosed, non-ventilated, dual-voltage, three-phase, 60-cycle 6 x 18-inch surface grinder spindle will be shown with a section of the cartridge cut away to demonstrate the unique Pope bearing set-up — double row cylindrical roller bearings and separate thrust bearings for no end-wise movement of the shaft.



Pope Precision Heavy-Duty Boring Spindle



Buy C/R Jawhead hammers, mallets, mauls from your local industrial supplier, or write for illustrated folder.



CHICAGO RAWHIDE MFG. CO.

1233 Elston Ave. Chicago 22, Illinois

IN CANADA:

Distributed by Super Oil Seal Mfg. Co., Ltd.,
Hamilton, Ontario

For more data circle 497 on Reader Service Card



The same type of spindles with high speed vertical attachments will also be presented.

Featured also will be the Pope motorized tool and cutter grinder spindle, which provides angular adjustment on both axes and permits the use of cup wheels for practically all clearance angles, resulting in stronger, longer lasting cutting edges. Visitors will also have an opportunity to inspect the new Pope wheel holder for surface grinders and tool cutter grinders. This new holder is quickly detachable, self-removing. It eliminates the need of a wheel puller. The spindle display will include heavy-duty, V-

new

GREAVES

3-XH Milling Machines

more
power at
the cutter!

The completely new GREAVES No. 3-XH Milling Machine brings added versatility, increased operational ease, and more power where it's needed most . . . at the cutter!

It utilizes two motors, one for spindle drive; a separate motor for moving table, saddle and knee. Compare this and the other outstanding features of the new Greaves Mill. You'll see why Greaves is "The MOST Mill for the LEAST Money."

Write for detailed literature!

GREAVES

MACHINE TOOL DIVISION

J. A. FAY & EGAN COMPANY
2700 Eastern Avenue, Cincinnati 2, Ohio

For more data circle 498 on Reader Service Card

March, 1956



PLAIN AND
UNIVERSAL
MODELS

- Wide range of speed/feed combinations for any type material, any type job.
- Heavy, internally ribbed column casting and heavy duty rectangular overarm for maximum rigidity.
- Large, heavy-duty knee, saddle and table provide accuracy for all types of milling.
- New 7½ HP spindle drive motor, with separate motor for movable components, provides extra power for heavy milling.
- Easy-to-reach controls. Handwheels and vertical crank disengage automatically when not in use.
- New rapid traverse lever within operating control area.
- Separate drive motor for table, saddle and knee provides more smooth balanced power at the cutter.

ASTE Exposition . . .

belt driven precision milling spindles and wheel heads, ranging from $\frac{1}{2}$ to 50 h.p., and belt driven, cartridge-type internal grinding spindles, including those for deep holes.

For more data circle 35 on Reader Service Card

★ ★ ★

SURFACE PLATE CALIBRATION KIT

A new device for calibrating surface plates will be shown in Booth No. 928 by Rahn Granite Surface Plate Co., 636 N. Western Ave., Dayton 7, Ohio. With this device, the manufacturer claims that it is possible to calibrate a surface plate with optical instrument precision, at 1/5 the cost of equipment, in 1/5 of the time and requiring only 1/5



Rahn Surface Plate Calibrating Kit in use

of the skill. A 24 x 36 inch surface plate can be completely calibrated in 45 minutes. No calculations are required. The

★ ★ ★



Always Specify ACE--
"STANDARD OF THE INDUSTRY"

VISIT OUR BOOTH 175 • ASTE CONVENTION • CHICAGO • MARCH 19 - 23

For more data circle 499 on Reader Service Card



ACE DRILL BUSHING CO., INC.
5407 Fountain Ave., Los Angeles 29, Calif.

March, 1956

SANFORD BENCH SURFACE GRINDER

MODEL SG

for Wet* or Dry Grinding!

PRECISION • SPEED • SENSITIVITY

A low cost, precision machine for surface grinding dies, instrument parts, gauges and other small parts which would fit in the palm of the hand.

By using Sanford Bench Grinders many manufacturers of precision machinery have drastically cut over-all costs for finishing small intricate parts. This releases large, more expensive machines for heavier duty work.

The Sanford SG is the only low cost Bench Surface Grinder that

- Grinds to less than .0001" tolerances
- Operates without vibration
- Assures long life because Meehanite castings are used in its construction

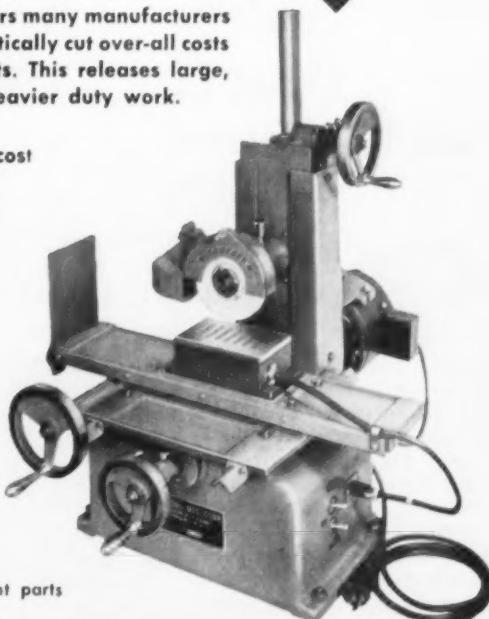
SPECIFICATIONS—4" traverse
—8" longitudinal—6" vertical
under 4" wheel. Approximate
weight 160 lbs.

Complete details are included
in illustrated bulletin.

Send for your copy today.

Reconditioning facilities, replacement parts
and special attachments are available.

Send for price list.



*With optional equipment

SANFORD MANUFACTURING CORP.

1022 Commerce Ave., Union, N. J.

For more data circle 500 on Reader Service Card

ASTE Exposition . . .

entire calibration consists of merely taking indicator readings under a straightedge, adjustably mounted so that it can always be supported in the exact reference plane. The precision of the calibration is limited only by the precision of the indicator being used. A precision of 10 millionths of an inch

can be attained with electronic indicators. A method of proving the accuracy of the straightedge is also supplied.

For more data circle 36 on Reader Service Card

★ ★ ★

INTERNAL GRINDING ATTACHMENT

In Booth No. 278, Royal Oak Tool and Machine Co., 29800 Stephenson Highway, Royal Oak, Mich., will display an internal grinding attachment, de-

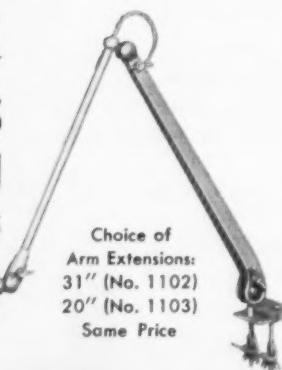
signed for the R-O Universal Form Relieving Fixture for form grinding internal cutting edges of hollow mills, trepanning cutters, and similar tools. Angular external surfaces of small cutters, that can not be conveniently ground with large wheels, can also be form relieved with the device. The new internal grinding attachment consists of a precision Vulcanaire 65,000 r.p.m. air spindle with Norgren filter and pressure regulator and utilizes regular shop air power. It can be positioned at any angle with easily-read machined markings and can be raised or low-

For Hard-to-Light Machines . . . New Adjustable-Arm

Air-Cooled Dazors with Side-Mounted Reflectors



Choice of
Arm Extensions:
31" (No. 1102)
20" (No. 1103)
Same Price



Now it's as easy to beam light into a recess, or around an offset, as onto a simple tool or bench position. This Adjustable-Arm Dazor with side-mounted reflector offers same low-cost air-cooled efficiency and positive tension control as top-mounted style. Uses 60-w bulb. Call your Dazor distributor. Dazor Manufacturing Corp. St. Louis 10, Missouri.

...Makers of

DAZOR FLOATING LAMPS

For more data circle 501 on Reader Service Card





Grind **EXACT**
SPIRAL POINTS
with the
BLAKE
Flute
Grinder



IN YOUR TAPS, as in lathe tools or milling cutters, correct rake angle on each cutting edge is all-important!

Grinding spiral points in taps demands exact indexing plus controlled shape of the flute to insure positive rake angle:

1. At the root of the first chamfer tooth.
2. At the crest of the last chamfer tooth.

The BLAKE FLUTE GRINDER gives you precise control of these important angles, both in the flutes and spiral points. It lets you grind the exact rake angle for best cutting in each material you tap.

It will pay you to investigate.

The Story's
Here.



Write for these booklets

EDWARD

BLAKE COMPANY INC.

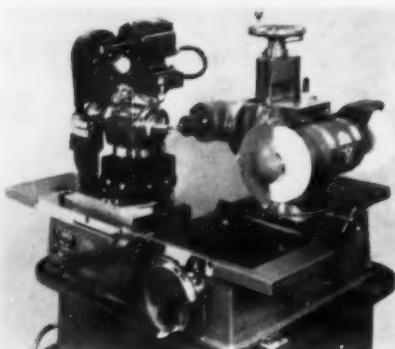
438 CHERRY ST., WEST NEWTON 65, MASS.

BLACK DIAMOND PRECISION DRILL GRINDERS • SURFACE FINISH STANDARDS • WORCESTER DRILL GRINDERS

For more data circle 502 on Reader Service Card

ASTE Exposition . . .

ered by means of a hand wheel. The unit mounts on the reverse side of the R-O grinder column so that, when the grinder is being used on conventional operations, the attachment is completely out of the way. By swinging the col-



R-O Internal Grinding Attachment in use

CAM MILLING

JIG BORING

A SPECIALIZED CAM MILLING SERVICE.
JIG BORING
...SPOT WELDING
...CONTRACT PRODUCTION
EXPERIMENTAL DEVELOPMENT

SEND FOR NEW CATALOG NO. 52-CN

EISLER ENGINEERING CO., INC.
734 S. 13TH ST., NEWARK 3, N. J.

For more data circle 503 on Reader Service Card

Micro Supreme

LAY-OUT AND IDENTIFICATION DYE

7 COLORS

For Tool, Die, Pattern or Template layout on metal . . . Quick identification of bar stock, sheets, strips or parts . . . Shows up in sharp relief—dries instantly . . . Write for sample and circular on company letterhead.

MICHIGAN CHROME & CHEMICAL COMPANY
8615 Grinnell Ave. • Detroit 13, Mich.

For more data circle 504 on Reader Service Card

umn counterclockwise 90 degrees, the internal grinding wheel can be brought into the side of the work. By swinging the column 180 degrees clockwise, it can be brought into the end of the work. For more data circle 37 on Reader Service Card

★ ★ *

DRILLING AND TAPPING MACHINES AND VALVES

In addition to the drilling and tapping machines and complete line of air and hydraulic valves, the Beckett-Harcum Co., 1087 Wayne Rd., Wilmington, Ohio, is featuring in Booth No. 545 a new series of valves for handling slurries, liquids, dopes and other viscous fluids that might thicken or "set up" when exposed to air. The valves

CUT TOOL COSTS

broken tools
made like new again
with **NU-TANGS**

Twisted or broken tangs replaced at low
costs on any tool with a Morse Taper (sizes 1 to 6)
Hundreds of leading industries save money on drills,
reamers, countersinks, cutters, drivers, the NU-TANG way.
Prompt delivery. Send for prices—or send tools for repair.
All work guaranteed.

NO WELDING! **NO SLEEVES!**
NO SHORTENING! **NO DISTORTION!**

Send them to us like this! **We return them like this!**

GUARANTEED STRONG AS NEW!

Patent No. 2,620,606

NU-TANGS Inc. 1339 Bates Avenue
Cincinnati 25, Ohio

For more data circle 505 on Reader Service Card

FREE!

**Page after page shows
the correct abrasive wheel to use**
(for the best Blanchard grinding results)



PUT IT ON THE BLANCHARD

THE BLANCHARD MACHINE COMPANY

64 STATE ST., CAMBRIDGE 39, MASS.

For more data circle 506 on Reader Service Card

March, 1956

modern machine shop 249



Blanchard wheels in silicate, resinoid and vitrified bonds.

This is our famous booklet *The Art of Blanchard Surface Grinding* — brought up-to-date with a third edition. It contains complete descriptions of our silicate, resinoid and vitrified bonded wheels. It also describes a number of jobs and shows you how to select the correct wheel for each job. Every Blanchard operator should have a copy handy — send for yours today.

Blanchard wheels are guaranteed for uniformity of grade. They're best for Blanchard grinders, best for every job. They give you maximum production, utmost economy . . . whether the work is tough as copper or fragile as glass, whether it requires heavy roughing cuts or precision grinding within .000010" of absolute flatness and surface finish of 1 micro-inch.

THE BLANCHARD MACHINE CO.
64 State St., Cambridge 39, Mass.

MMS

Gentlemen:
Please send me a free copy of "The Art of
Blanchard Surface Grinding" (3rd Edition).

NAME.....

FIRM.....

STREET.....

CITY..... ZONE..... STATE.....

ASTE Exposition . . .

How To Increase Production And Improve Accuracy



With a SUNDSTRAND Automatic Index Base

In many cases, the addition of this Automatic Index Base has increased milling production enough to eliminate need for the purchase of additional machinery. It may be the answer to your milling production requirements. Call in a Sundstrand engineer. There is no obligation for this service.

**Accurate
Spacing,
Powerful
Clamping
Insures
Accuracy**



Sundstrand
Automatic Index Base

This automatic index base is designed so there is no strain against the index plunger during the cut. The base is locked by powerful clamping so that accuracy of index is not affected by heavy cuts.

Get Complete Data Free

This 8 page booklet contains production figures and specifications. Send for your copy today. Ask for bulletin 562.

SUNDSTRAND MACHINE TOOL CO.
2539 Eleventh Street, Rockford, Ill., U.S.A.

For more data circle 507 on Reader Service Card

250 modern machine shop



Beckett-Harcum Model BP Type VII Valve

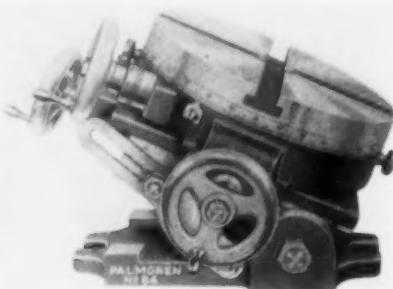
have additional ports for piping solvent through them. Wipe-off and seepage of the fluid is carried off by the solvent, therefore keeping the valve clean and operative over long periods of time before "wash down" is necessary. The valves are remote piloted by air, since most applications are for explosive liquids.

For more data circle 508 on Reader Service Card

★ ★ ★

ROTARY TABLES, VISES AND MILLING ATTACHMENTS

In Booth No. 262, Chicago Tool and Engineering Co., 8399 S. Chicago Ave., Chicago 17, Ill., will exhibit the following new items: Palmgren No. 84 Rotary Tilting Table; Palmgren No. 23B

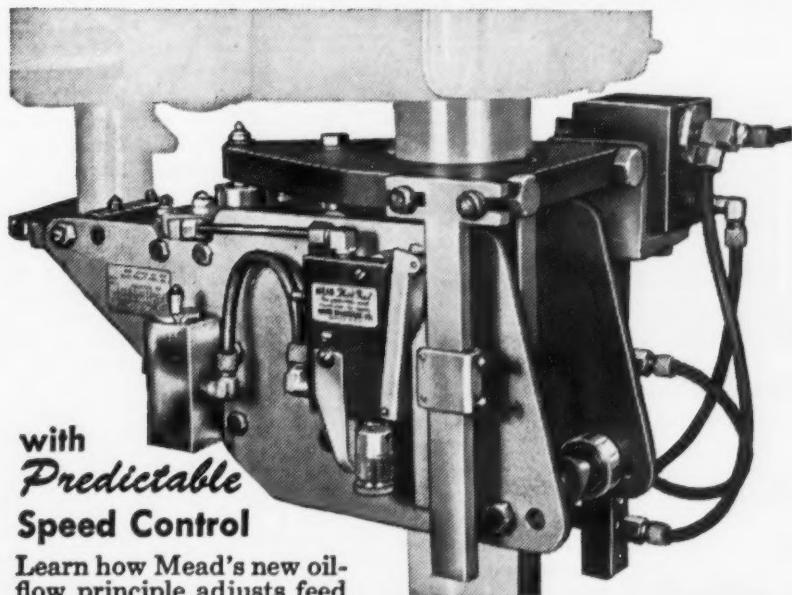


Palmgren No. 84 Rotary Tilting Table

March, 1956

New Fluid Feed AIR-HYDRAULIC DRILL PRESS FEED!

Combines Steady Even Hydraulic Control with Economical Dependable Air Power!



with
Predictable
Speed Control

Learn how Mead's new oil-flow principle adjusts feed rate accurately 2 to 60 inches per minute—other superior features. Write factory or nearest Mead Man for folder plus Catalog of Mead units suitable for automation with it!

MEAD
SPECIALTIES COMPANY

4114 N. Knox Ave., Dept. AA-36
CHICAGO 41, ILLINOIS

PATHFINDER IN AIR POWER AUTOMATION

For more data circle 508 on Reader Service Card

ASTE Exposition . . .

3-Inch Angle Vise; Palmgren No. 40B
4-Inch Swivel Machine Vise; Palmgren
No. 74 4-Inch Air Vise; Palmgren No.
94 4-Inch Lever Lock Vise; Palmgren
No. 100 Bench Mill; Palmgren No. 55
2½-Inch Three-Way Angle Vise; and
3, 4, 6 and 8-inch Palmgren swivel
production vises. Also displayed will be
the complete Palmgren line of drill

press vises, angle vises, swivel machine
vises, production vises, rotary tables,
angle plates and milling attachments.

For more data circle 39 on Reader Service Card

★ ★ ★

PRECISION MAGNETIC BASE TOOL

In Booth No. 651, Enco Mfg. Co.,
4524 W. Fullerton Ave., Chicago 39,
Ill., will introduce the "Tiny-Titan"

No. 220 Magnetic Base Tool which
combines pin-point lighting
with powerful magnification. The uniquely
designed tool consists of a magnetic base, a magnifier and a lighting unit. The magnetic base measures $1\frac{1}{4} \times 1\frac{7}{16} \times 1\frac{1}{2}$ inches high. It utilizes a sure-grip, non-breakable Tenite plastic case, equipped with vertical ribs for deftness of manipulation. The magnetic pull is 65 pounds. The double-lens, non-distortion, 5X power magnifier measures 2 inches in diameter. It may be turned at any angle or plane. A new, foolproof swivel adapter allows 360 degrees of adjustment in all directions, locking securely. The lighting unit



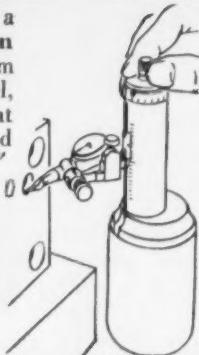
with GREIST MICRO-HEIGHT® GAGE

Precision-built Micro-Height scribes like a vernier height gage, **reads faster than your micrometer!** You read direct from zero at base to 3". Hundredths on barrel, thousandths on large-diameter head that **cuts reading time!** Precision ground and lapped Riser extends range to 9"

CUT INSPECTION TIME!

Add your dial indicator to quickly read distances between holes, surfaces.

Precision-built, satin-chrome finished Micro-Height Gage quickly pays for itself! Call your distributor or write:



THE **GREIST** MANUFACTURING CO., 493 BLAKE ST., NEW HAVEN 15, CONN.

Precision Products since 1871.

For more data circle 509 on Reader Service Card

Investigate

NEW ABRASIVE APPLICATIONS

Never Before Associated with Finishing....

RUBBER-CUSHIONED "JOB-MATCHED" STOCK ABRASIVES

That Do The Work Of "Specials"!

NOW YOU CAN COMBINE OPERATIONS, REPLACE SLOWER, COSTLIER METHODS. Use the same stock "job-matched" Brightboy textures you select for special jobs to do many other kinds, too.

UNBELIEVABLE? Perhaps. But it's true! Not until you have tried Brightboy and witnessed its unique rubber-and-abrasive action can you appreciate the completely new, wider concept which it has pioneered in finishing.

Brightboy BURRS, CLEANS, FINISHES, POLISHES—frequently in one operation. It is available in both Silicon Carbide and Aluminum Oxide grains, each in combinations of grain sizes and textures from extra fine to extra coarse, in soft, firm and tough rubber binders. Its versatility and adaptability will amaze you.



Brightboy is also made in a full range of accessory products: Rods, sticks and blocks for machine and manual operations.

**BRIGHTBOY INDUSTRIAL DIVISION
WELDON ROBERTS RUBBER CO.**

95 North 13th Street • Newark 7, N. J.

America's Pioneer Manufacturer
of Rubber-Bonded Abrasives

For more data circle 510 on Reader Service Card



DIAMETERS TO 8"

Ask your dealer to recommend the readily available Brightboy stock abrasives best suited to your work, and also for the new Brightboy catalog. Write us if he cannot supply you, or with regard to any problem in which finishing is involved.



ASTE Exposition . . .

utilizes a rayon-flocked shield for protecting hands and eyes and resisting heat, as well as a nickel-plated brass socket with turn-button switch. It is equipped with a unique clamp for adjusting the light and shield to any level or angle. One 25 and one 40 watt bulb

INCREASE AVAILABLE CLAMPING CAPACITY

The illustration shows a black machine vise set consisting of a clamp base and a head base. The clamp base is mounted onto a white slot table. The head base features a dial indicator and a handle. The text "CLAMP BASE" and "HEAD BASE" are labeled near the respective components.

with REPCO

2-Piece Machine Vise Set

Cuts costs . . . supplements use of one-piece vises. Machined for precision accuracy.

- Two Sizes—6" and 8" widths. Depth 2½". T-Slot center distances: 2¼"-2¾", 2½"-3¾".
- Greater Versatility—useable as general purpose vise, as an angle block, as separate clamping device.

Write for Bulletin 100 - Dealer Inquiries Invited

ROCKFORD ENGINEERED PRODUCTS CO.
2324 23rd Avenue • Rockford, Illinois

For more data circle 511 on Reader Service Card



"Tiny-Titan" No. 220 Magnetic Base Tool

is included with each unit. Also included is a 6-foot plastic, oil resistant cord. The unit plugs into any 110 to 120-volt a.c. or d.c. outlet.

Also to be exhibited will be the regular line of "Tiny-Titan" magnetic base dial indicator holders and lights and the Enco line of lathe turrets.

For more data circle 40 on Reader Service Card

★ ★ ★

QUICK-CHANGE TOOLHOLDERS AND ADAPTERS

In Booth No. 812, "Kwiklok" Quick-Change Toolholders and Adapters with T.I. drive will be exhibited by Falcon Tool Co., P.O. Box 4605, Detroit 34, Mich. According to the manufacturer,

LONGER-LIVED—SAYS U.S. TESTING CO.

55% longer life, 50% higher cutting rate, by test. 47 shapes and sizes for internal grinding. Also Diamond Wheels, Core Drills, Thin Cut-Off Wheels, Resinoid Bond Diamond Wheels, and Carbide Rotary Cutting Tools.

write for illustrated catalogue

STARLITE INDUSTRIES, INC. PHILA. 39, PA.

For more data circle 512 on Reader Service Card

STARLITE
mounted diamond
points and wheels



**STARLITE AT CHICAGO
ASTE—BOOTH 300**



FOR LESS THAN \$40 YOU GET 12 SETS, EACH SET GROUND READY TO GO

Men would not accept either idea at first **INSERT CHASERS SAVE UP TO 33%**

Insert chasers are like safety razor blades: they cost so little that you can throw them away when dull. Or, for utmost economy, you can resharpen them over and over again. Only a flash grind is required. For less than \$40 you get a dozen sets of $\frac{3}{4}$ —16 insert chasers, each set ground ready to go. You will be amazed at the quantity of threads they will cut, even to Class 3 specifications, with a minimum of downtime.

free: "Unified and American Screw Thread Digest"

THE EASTERN MACHINE SCREW CORPORATION

40-50 BARCLAY ST.

NEW HAVEN, CONN.

For more data circle 513 on Reader Service Card

THRIFTMASTER...

**your source for
dependable
DRILLHEADS**

Universal Joint Type Drillhead . . . Full Ball or Bronze Bearing Construction, Standard or Heavy Duty. From $\frac{1}{2}$ " minimum centers up. Capacities to $\frac{1}{2}$ " in Steel.



Single and Double Eccentric Type Adjustable Drillhead . . . Enclosed, Full Ball Bearing Construction. New Double Eccentric Type illustrated.



Special Fixed Center Drillhead . . . Made to your requirements. Full Ball Bearing Construction.



- ★ We stock or can build the *right* drillhead for your jobs.
- ★ Write for your free copy of the THRIFTMASTER CATALOG or phone for a rush, on-the-spot quote.



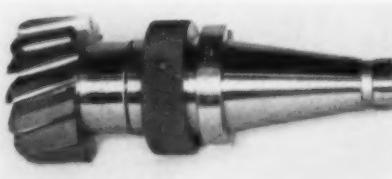
Subsidiary of
Thomson Industries, Inc.
THRIFTMASTER Products Corporation
1034 N. PLUM STREET
LANCASTER, PA.

Also Makers of

DORMAN AUTOMATIC REVERSE TAPPERS
For more data circle 514 on Reader Service Card

256 modern machine shop

ASTE Exposition . . .



Falcon "Kwiklok" Quick-Change Toolholder

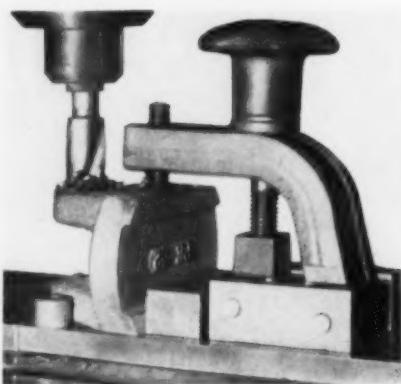
"Kwiklok" quick-change toolholders and adapters quickly receive and drive standard and special shank-type tools, providing maximum production, rigidity and accuracy.

For more data circle 41 on Reader Service Card

★ ★ ★

RETRACTING CLAMPS AND JACK ASSEMBLIES

Lodding, Inc., Worcester 1, Mass., will exhibit new work-holding retracting clamps and jack assemblies in Booth No. 735. The retracting clamps are furnished in both air and hand-operated models, in four sizes each of



View of Lodding Retracting Clamp in use

March, 1956

never
over
intense

never
under
intense



VIMCO[®] Lights

adjust easily for
soft, comfortable
non-fatiguing light!

Don't neglect adequate light for precision machine work. Install Vimcolights on your machines to boost worker efficiency. Vimcolights are never over-intense . . . never under-intense! Because of their high degree of adjustability, they supply the "just right" light that eliminates wasteful eye fatigue during long periods of steady machine operation. Easy to install. Sturdy for life.

Machine Builders: Send
for "OEM Bulletin".

Vimcolights are
Production Men: Send
for "Bulletin 85".



LISTED

VIMCO MFG. CO., Inc.
Since 1919



111 BRAYTON STREET
BUFFALO 13, NEW YORK

For more data circle 515 on Reader Service Card

ASTE Exposition . . .

four styles, and are adaptable for all work. According to the manufacturer, the jack assemblies have rendered make-shift setups obsolete. The company carries a complete stock of 650 jig and fixture parts.

For more data circle 42 on Reader Service Card

★ ★ ★

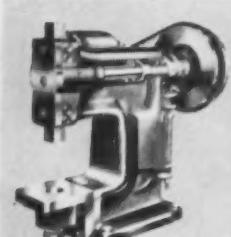
STANDARD MASS PRODUCTION MACHINE BASES

Ferguson Machine and Tool Co., Roller Gear Division, P.O. Box 5841, St. Louis 21, Mo., will display in Booth No. 350 two basic types of standard mass production machine bases, required by the tool engineer to transfer a workpiece from one set of tooling to another. One, the "Intermittor," is a high speed, precision index table at-



Ferguson Model 36HT-12-270 Intermittor

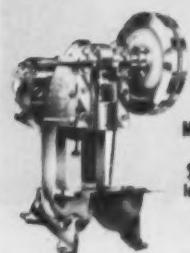
taining production speeds as high as 30,000 pieces an hour. There are more than 150 standard models in the line with dial sizes ranging from 12 to 60



Model LTX 1 ton — \$170.50
Special Duty less motor



Model B-2-A
2 ton half press
\$84.50



Model B-5
5 ton
\$198.50
less motor

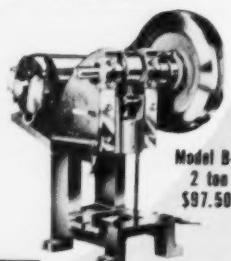
Heavy Duty Bench Type **ALLEN** PUNCH PRESSES

**Powerful
Dependable and Economical
Fully Guaranteed**

**Many Popular Models
½ to 5 ton capacities
Moderate in price**

See Your Supply Dealer or write for FREE punch press catalog giving complete information, specifications and prices on our complete line of bench type punch presses.

**ALVA ALLEN INDUSTRIES
Dept. MM Clinton, Mo.**



Model B-2
2 ton
\$97.50

Tilting Model
\$127.50
less motor

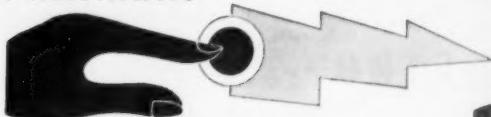
For more data circle 516 on Reader Service Card

MORE PROFITS PER HOLE

with CLEEREMAN

"Series A"

Automatic



More Holes per Labor \$\$\$

An automatic cycle that sets the production pace. Push button control leaves the operator free to handle piece parts easier and faster.

More Holes per Tooling \$\$\$

The power to produce, coupled with extreme rigidity, drives cutting tools at utmost efficiency.

More Holes per Capital \$\$\$

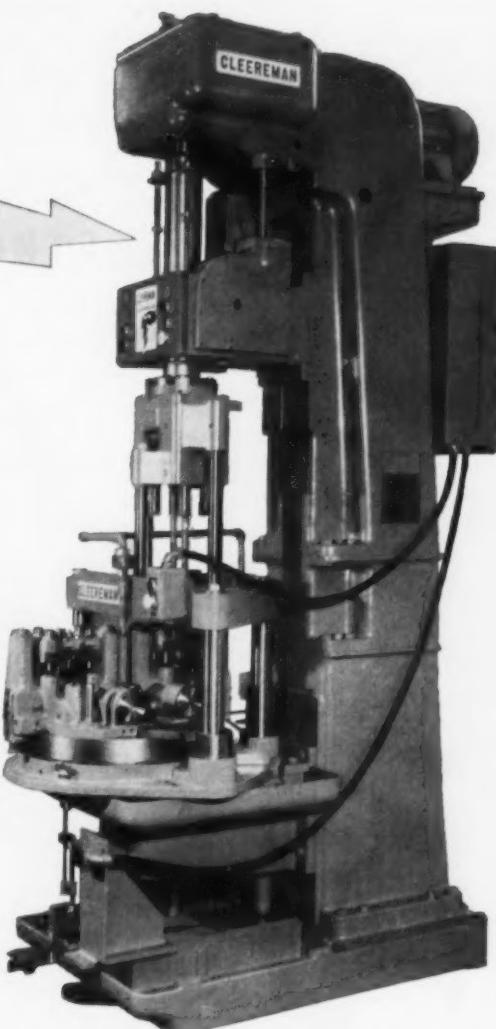
Fast set-up features, extreme versatility and operating speed broaden application and minimize idle time.

This machine,

equipped with two-station air operated indexing fixture and four spindle heads, has more than doubled previous production. Present installations are giving 125 to 600 cycles per hour with ease. The only limit is the machinability of your product.

WHAT is your problem?

Contact your nearby Cleereman distributor—or phone, wire or write direct.



CLEEREMAN MACHINE TOOL CORP., Green Bay, Wis.

For more data circle 517 on Reader Service Card

ASTE Exposition . . .

inches and numbers of stations varying from 4 to 36. As displayed, the Intermittor will include a standard power section with motor, Micro-switch, electric clutch-brake combination and reducer. The power section, called the "Vari-Dwell," synchronizes the action of the tooling to the index table and

provides either remote control of dwell or direct drive with the clutch acting as a safety mechanism. A standard stand is also included, resulting in a complete production implement, ready for the designer to add any tooling.

A standard straight line transfer machine for more complicated automatic assembly, known as the "Trans-O-Mator," will also be in operation. The machine will be 14 feet long and have 60 stations. It is equipped with a

complete power transmission unit, including motor, reducer, electric clutch-brake, Ferguson Drive for smooth indexing, chain and product carriers and control shaft for tooling actuation. A standard control panel, with an electrical interlock between the indexing and tooling power supply and connections for automatic scanning devices, is also provided. The Trans - O - Mator, a multi-purpose unit designed for use in any industry where automation of small parts is feasible, may be tooled and retooled as changes in production runs require. It operates at rates up to 6,000 pieces an hour.

Another product to be exhibited

TREPANS

- Maximum Diameter — $\frac{5}{8}$ inch.
- For fast-production, multi-spindle machines.
- Specially heat-treated, high speed steel.
- With back taper or radial relief.
- Made by specialists in the design of small tools.



WOODRUFF & STOKES CO.

INCORPORATED

Bldg. 32, 357 Lincoln St., Hingham, Massachusetts

For more data circle 518 on Reader Service Card

PRATT & WHITNEY

TRI-ROLL Thread Comparators

SOLVE ANOTHER QUALITY CONTROL PROBLEM Requiring:

A COMPLETE FUNCTIONAL THREAD CHECK...

This requirement in the Quality Control system of a large manufacturer of high quality screw thread fastenings was met by using full length gaging rolls. Errors in lead, angle and pitch diameter are read cumulatively; taper and out-of-round also detected.

PLUS A CRITICAL PITCH DIAMETER

CHECK . . . accomplished by using two-ribbed rolls truncated to $\frac{3}{8}$ pitch crest flat and cleared root.

for a WIDE RANGE OF PRODUCT

SIZES . . . Even the largest, special screw threads are gaged rapidly, accurately and economically. Adaptation requires only simple fixtures.

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Use the coupon below to send for Tri-Roll Circular No. 570 . . . or write on your company letterhead outlining your gaging requirements.



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25 Charter Oak Blvd., West Hartford, Connecticut
Please send my free copy of Circular No. 570

NAME _____

POSITION _____

COMPANY _____

CO. ADDRESS _____

CITY _____ ZONE _____ STATE _____

For more data circle 519 on Reader Service Card

ASTE Exposition . . .

is the Ferguson Drive, a cam indexing mechanism for production machinery employing intermittent motion. The drive consists of a hardened and ground cam with a tapered rib and a hub with preloaded ball bearing followers. The special configuration of the

cam rib results in a mechanism with modified trapezoid acceleration characteristics. With forces applied gradually, vibrations are held to a minimum, and indexing speeds as high as 1,000 a minute are possible. Used in dial feeds, roll feeds, carrier and chain operations and other types of angular or lineal intermittent motions, the drive is said to achieve a precision of 0.001 inch and zero backlash without lock pins. They are rated for 8,000 hours maintenance-free operation with complete renewal for a like period possible merely by replacing standard bearings in the followers.

For more data circle 43 on Reader Service Card



THREE-STATION GEAR GRINDING MACHINE

A three-station grinding machine, for burring and chamfering both the inside and outside edges of hypoid gear teeth, will be introduced in Booth No. 613 by Modern Industrial Engineering Co., 14230 Birwood Ave., Detroit 38, Mich. The latest developments in Burr-Master gear deburring and chamfering machines will also be on display, and several of the machines in the exhibit will be getting their first public showing.

Three ring gears are chamfered at a time on the Modern chamfer grinding machine, giving a production rate of

"ALL-WAY" LEVEL



The Fell Precision Level shows the level of all directions at once to an accuracy of .0005 inch per foot. It saves time in the manufacture and maintenance of machinery. Made in sizes 3 1/2" x 6" and 5 1/2" x 12", also 4" and 5" dia. for permanent mounting.

Write for Circular

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320 McLAIN AVE.

ROCKFORD, ILL.

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SPEEDY and SAFE CASE HARDENING NON-POISONOUS • NO SPECIAL EQUIPMENT

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1 lb., 5 lb., 10 lb., 25 lb., 50 lb., 100 lb. containers.

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799 GREENWICH STREET BOX G NEW YORK 14, N.Y.

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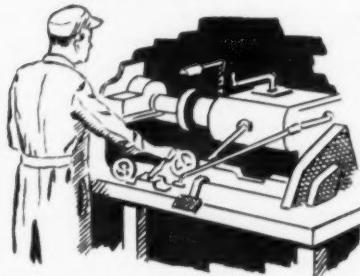
HAMIKLEER

*REG. U.S. PAT. OFF.

RATED **BEST** OF 17 COOLANTS TESTED!

DILUTION: 1 to 70 PARTS WATER

No signs of rust or rancidity even on cast iron during 9 month test on grinding, cutting, threading, boring, turning and honing operations.



A metalworking firm—well-known for precision work and outstanding technical skill—tested 17 different coolants. They wanted one coolant that would give excellent performance on many metalworking operations on cast iron and hard and soft steels. Results? Hamikleer outperformed all other coolants . . . And, in spite of hot, humid summer weather, there were no signs of rust or rancidity when Hamikleer was used.

Eliminates Need For Many Different Products

The one coolant, Hamikleer, can be used for practically all metalworking operations. It replaces soluble oils and eliminates disposal problems, for it can be run down drains if oils do not get into the mixture. It also replaces kerosene for honing. It dissolves in any kind of water to make a clear, thin, odorless, rancid-proof synthetic lubricant that will not foam, decompose, gum or become tacky. It assures fine surface finish and increases tool life.

TEST HAMIKLEER in your own plant at our expense.

Send for a sample today.



HARRY MILLER CORP.

Original Products and Processes
4th and BRISTOL STREETS
PHILADELPHIA 40, PA.

For more data circle 522 on Reader Service Card

ASTE Exposition . . .

300 per hour. One operator can easily handle all three stations. Two air-driven spindles, mounting small grinding wheels for the deburring and chamfering operation, are located at each work station. Balanced spindles, mounted on anti-friction bearings, are infinitely adjustable so that the grinding wheel may be set in proper relation to the gear teeth. One grinding wheel chamfers the inside diameter, while the other simultaneously performs the same job on the outside diameter. The effect of this operation is not only to remove burrs, but to eliminate tooth interference by means of the chamfer. A chamfer is ground all around the tooth form, including the root and toe, with the grinding wheel actually being cammed around the tooth form by the rotation of the workpiece and the fact that the spindles are counterbalanced.

A part holding fixture, mounted on the work station spindle, rotates con-

tinuously at a slow rate. After the operator places a part in position, he actuates dual start buttons, located on opposite sides of each work station, to raise the work into grinding position and lower the grinding heads. Upon completion of one revolution of the workpiece, the grinding spindle automatically is raised from the work and the part is lowered for unloading. All three stations function independently, but identically, to one another. A bracket is provided at each work station for storing the mating pinion gear while work is being performed on the ring gear. Various sizes of parts can be handled on this machine. By adjustments in the tooling, a variety of straight and spiral bevel gears can be chamfered on the machine.

For more data circle 44 on Reader Service Card



SHORT RUN STAMPINGS

Federal Tool and Mfg. Co., 3615 Alabama Ave., Minneapolis 16, Minn., will exhibit hundreds of actual job samples of various short run stampings in Booth No. 170. The samples to be displayed are representative of what can be accomplished through short run stamping processes. Included in the samples are parts stamped out of steel, stainless steel, aluminum, copper base alloys and phenolics. Tagged samples with actual prices will also be distributed at the show.

For more data circle 45 on Reader Service Card



AUTOMATIC VERTICAL BORING MACHINE

Precision, compactness and versatility are said to characterize an automatic vertical boring machine which will be displayed in Booth No. 135 by Wadell Equipment Co., 119 South Ave., Garwood, N. J. The machine is design-



Modern Three-Station Gear Grinding Machine

Need Stainless Bar Stock? TRY ARMCO FIRST

Chances are you'll find the grade you want, because Armco produces one of the widest varieties of stainless bar and wire in the industry.

Large stocks of standard stainless steels and special machining grades assure prompt delivery. Newly expanded facilities help speed rolling of special orders, too.

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Sheffield Steel Division • Armco Drainage & Metal Products, Inc. • The Armco International Corporation



For more data circle 523 on Reader Service Card

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BROADMASTER VISUAL CONTROL

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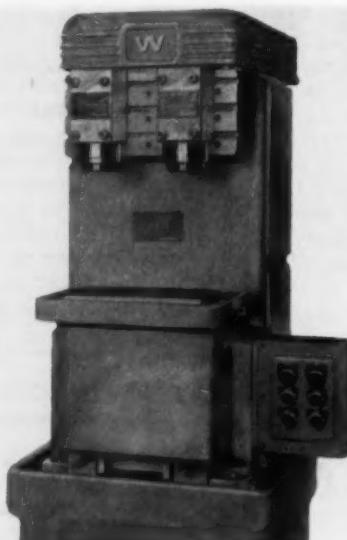
For more data circle 524 on Reader Service Card

266 modern machine shop

ASTE Exposition . . .

ed primarily for precision boring, counterboring, facing and chamfering. According to the manufacturer, the machine is capable of maintaining tolerances as close as 1/10,000th of an inch and surface finishes of 10 micro-inch r.m.s. when properly toolled. Compact and rigidly designed, the vertical boring machine occupies only 4 square feet of floor space and is intended to replace larger machines in the production of small and medium size parts.

Featuring an intermittent or continuous automatic cycle, the machine can be automated either as a single or multiple unit; it may also be used as a unit of a production line in conjunction with other automatic machines. The standard cycle time is from 5 to 80 seconds; however, the machine may be equipped with a faster or slower cycle if desired. It is available with or without tooling. The maximum stroke is 4



Wadell Automatic Vertical Boring Machine

March, 1956

Talking About Die Sets



with

Phil Marsilius
Vice-President
The Producto Machine Co.

"Tooling for Tomorrow"—This month's ASTE Exposition in Chicago offers you an opportunity to find out whether your tooling practices and facilities are keeping pace with the many technological advances being made throughout industry. You will be able to see the latest tooling developments on display in more than 450 exhibits.

Major die set advances have been made since the last Tool Show and many of the leading die set manufacturers will be exhibiting them at the International Amphitheatre. "Tooling for Tomorrow" includes radical changes in the design, appearance, performance and accuracy of die sets and their components; new lubrication methods; and numerous new die accessories. The Tool Show is a rare occasion for you to inspect, compare and select the developments best suited to your particular die set requirements.

Related diesmaking equipment, of course, will be displayed along with thousands of other products intended to improve your manufacturing operations. The editorial pages of this magazine give you an excellent preview of some of the outstanding tools, machines, materials and processes to be demonstrated for the first time in Chicago on March 19-23.

You will also want to attend a number of the ASTE technical sessions. Such vital topics as "Plastic Tooling Challenges the Tool Engineer" and "Solving Carbide Die Problems" are on the well-balanced program. And you can choose from 12 conducted tours to plants in the Chicago area.

If you have not yet made plans to attend the ASTE Exposition, we urge you to do so. We cordially invite you to stop at Booth 396 for a personal chat about die sets.



Try Our "Blindfold Test" at the Show and See How:

PRODUCTO'S NEW DIE SET CAN ASSEMBLE ITSELF!

Yes, it's true. An ingenious guide pin design feature, new and exclusive with Producto, enables the die set to practically assemble itself. You can test it in Booth 396 at the ASTE Show in Chicago. *We guarantee you will be able to assemble the set blindfolded...using just one hand!*

This is a real boon to the man on the bench. For him, a Producto die set means no more fussing to line up pins and bushings...no more need to hammer punch holder down on pins. He can start the punch holder on straight or at any angle...and the die set puts itself together. It never cocks, never jams.

While this new feature is special to a particular line of pins—available from all Producto warehouses soon after the Show—all Producto guide pins have been improved with greater press fit lengths, smoother end radii and mirror-like surface finish of 7-9 micro-inches.

Producto's new pins and new bushings[®] are added reasons you should call your nearest Producto branch for precision die sets...fast. Be sure to see these important developments in Booth 396 at the ASTE Show.

**Featured in current Die Set Digest with other valuable data for the diesmaker and user. Write today for your free copy.*

THE PRODUCTO MACHINE COMPANY
910 Housatonic Avenue, Bridgeport 1, Connecticut
Telephone: FOrest 7-8675

For prompt die set service, phone these PRODUCTO assembly warehouses:

| | | | | | |
|-----------|-----------|-------------|-----------|--------------|------------------|
| Atlanta | CY 7667 | Detroit | LI 6-7800 | Newark | MI 2-1773 |
| Chicago | ES 8-3307 | Kansas City | BA 9033 | Philadelphia | MO 4-1010 |
| Cleveland | SU 1-6158 | Los Angeles | TR 9826 | Rochester | GL 1810, GL 5357 |
| Dayton | MU 1651 | New York | WO 4-7484 | St. Louis | PR 1-3370 |

or check Yellow Pages in any other stamping center for distributors stocking PRODUCTO.

Produce More With

PRODUCTO

Precision Die Sets



For more data circle 525 on Reader Service Card

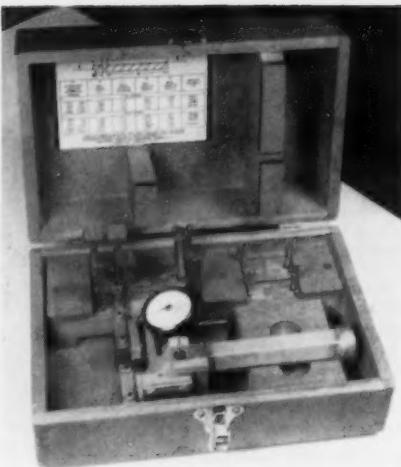
ASTE Exposition . . .

inches and the maximum spindle speed is 8,000 r.p.m. The machine will be demonstrated under operating conditions. For more data circle 46 on Reader Service Card



THREAD GAGES

The Bryant Gage and Spindle Division, Bryant Chucking Grinder Co., Box 620D, Springfield, Vt., will display the following products in Booth No. 901: Bryant B-21 Bench Gages for checking internal and external threads with attachments for checking concentricity and squareness of face in relation to a thread; Bryant P-21 Portable Thread Gages for checking internal threads; Bryant P-21 Portable Groove Gages for checking O-ring and snap ring grooves; Bryant "True" Granite



Bryant Portable Groove Gage and segments

Surface Plates and stands; Bryant high-frequency wheel heads; Bryant high-frequency spindles; belt-driven

PRODUCTION TOOLS by APEX

**END MILLS
WITH
INTEGRAL
SHANK**

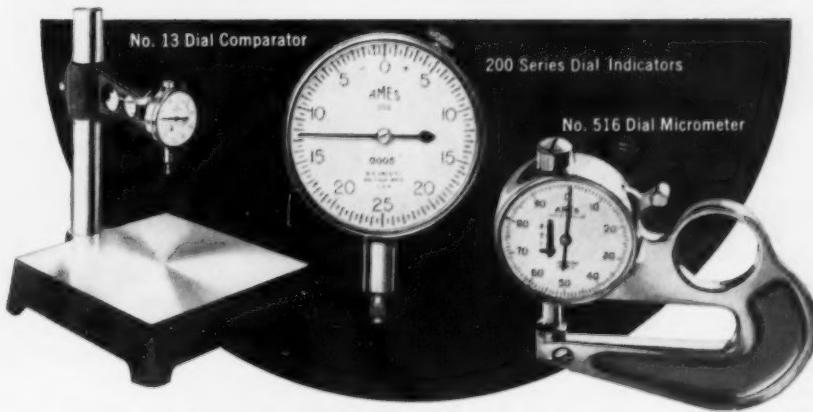
Made with DROP FORGED H.S. or cobalt steel blades. Also carbide tipped to your specifications. Bodies drop forged and heat treated. Serrations provide minimum adjustment, and with ease, as no locks or pins are needed with this tapered blade. APEX engineers will gladly co-operate with you on tooling. Send for catalog.

See the Entire Line At Booth 174 ASTE TOOL EXPO. CHICAGO March 19-23

THE APEX TOOL & CUTTER CO., SHELTON 15, CONN.

For more data circle 526 on Reader Service Card

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...the preferred on every job
for time-saving accuracy and dependability

Today, as for the past half century, Ames instruments are solving industry's toughest measurement problems, while providing unquestioned accuracy through millions of cycles.

We will gladly make recommendations on your measurement problems. Please send prints and specifications. And ask for your free copy of the Ames catalog.

Representatives in principal cities

Booth 934
ASTE Show
March 19-23



B.C. AMES CO.

29 Ames Street, Waltham 54, Mass.

MANUFACTURER OF MICROMETER DIAL GAUGES • MICROMETER DIAL INDICATORS

For more data circle 527 on Reader Service Card

March, 1956

modern machine shop 269

ASTE Exposition . . .

wheel heads; boring heads; and magnetic drums for computers.

The Bryant P-21 Portable Groove Gage is a new gage and is available as a complete kit with segments covering O-ring and snap ring grooves through 5 inches. Other new products to be demonstrated at the show will include

the new Bryant Series 800 high-frequency wheel heads and magnetic drums for computers.

For more data circle 47 on Reader Service Card



MARKING EQUIPMENT

Geo. T. Schmidt, Inc., 1806 W. Belle Plaine Ave., Chicago 13, Ill., will feature the Model 365 Junior Hydraulic Marking Machine in Booth No. 1311. The Model 365 provides all the functions of the company's larger machines for normal marking operations requiring up to 8,000 pounds pressure, with a maximum lettering length of 3½ inches. This compact, well-designed unit is built with a heavy die

FISKE'S LUBRICANTS A BIG AID IN WORKING ALUMINUM

Since 1870
These Fiske Lubricants are especially recommended for the successful working of Aluminum and Aluminum Alloys.

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| Machining..... | C.S.A. No. 2 Cutting Oil |
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Cleaner Product and less tool wear are the reasons why Fiske Lubricants are used in progressive metal working plants that produce the highest types of aluminum products.

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METAL WORKING LUBRICANTS

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Schmidt Model 365
Junior Hydraulic
Marking Machine





**useful
data
for you**



American's revised catalog 450
of Broaches, Broaching Machines
and Broaching applications

TABLE OF CONTENTS

- Typical broaching applications
- Broach design data
- Typical broach sections
- Broach maintenance
- Broach pull head types
- Basic machine types
- Standard keyway broach chart

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See *American's* First — for the Best in Broaching Tools, Broaching Machines, Special Machinery

For more data circle 529 on Reader Service Card

March, 1956

modern machine shop 271



ASTE Exposition . . .

slide which operates on roller bearings. Simplified controls and quick, simple adjustment of the table and die slide stroke are said to make this an ideal machine for general marking operations. The machine is capable of handling flats up to 5 inches thick and

rounds up to 5 inches in diameter. The marking capacity is four lines of 1/16-inch characters, three lines of 3/32 or 1/8-inch characters, or two lines of 1/4-inch characters. According to the manufacturer, the machine will mark lines with a knurl on flats up to 3 3/8 inches long. It will also mark lettering up to 3 3/8 inches long on rounds rotating in cradle and up to 1-11/16 inches long on rounds which roll on the table. Production with this equipment is said to range from 800 parts to 1,000 parts per hour.

The table of the marker measures 5 1/2 x 10 inches and can be adjusted 4 inches by means of a handwheel. The table stroke is 1 inch. The die stroke ranges from 3/8 to 3 1/2 inches, and die slide dimensions are 3 x 3 1/2 x 10 inches. Distance between the uprights is 10 inches. The machine utilizes a 1 1/2-h.p., 1,725-r.p.m. motor equipped with a safety overload switch. It requires a floor space of 18 x 20 inches and is 56 inches high.

For more data circle 48 on Reader Service Card

"SEALFLEX" TUBING



**Leakproof—
Stays in place
For Coolants, Cutting
Oils, Solvents**

Made of steel with brass fittings — males, nozzles, stopcocks, etc., made in 1/8", 1/4", 3/8", 1/2", 5/8", 3/4" I.D. Write for bulletin and prices.

VERMONT FLEXIBLE TUBING CO.
Lyndonville, Vermont

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RECLINABLE POWER PRESSES



Ideal for general stamping work . . . 4 to 100 tons capacity. Can recline to 40° with perfect safety.

Our catalog contains a wide variety of press types and sizes. Write for it today.

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ZEH & HAHNEMANN CO.
190 VANDERPOOL ST. NEWARK 5, N. J.

For more data circle 531 on Reader Service Card

AUTOMATIC HARDNESS TESTER

The latest advances in hardness testing will be displayed in Booth No. 909 by the Wilson Mechanical Instrument Division, American Chain and Cable Co., Inc., 230-G Park Ave., New York 17, N. Y. Featured will be the latest

READING BENCH

KEYSEATER

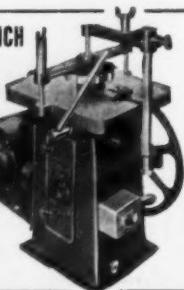
Portable—move directly to job; a time saver for both small and large shops.

3 3/4" stroke; adaptable for other work.

Low first cost—prompt delivery.

Good dealers wanted.

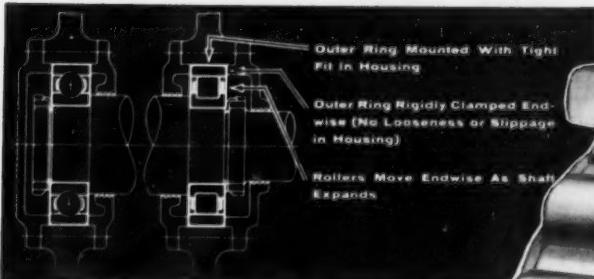
READING MACHINE CO.
CINCINNATI 37, OHIO



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**For Shaft Expansion and/or Heavy Radial Load
use NORMA-HOFFMANN**

Precision Cylindrical Roller Bearings

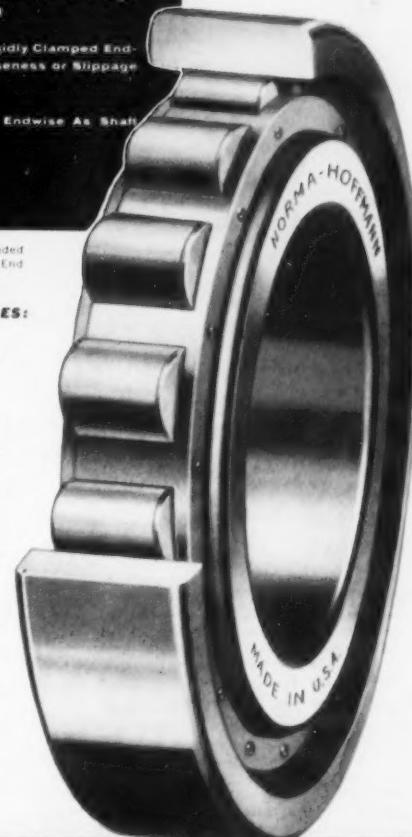


Typical Mounting Using Clamped Ball Bearing At Lightly Loaded End Of Shaft And Clamped Roller Bearing At Heavily Loaded End.

CHECK THESE ROLLER BEARING ADVANTAGES:

1. No Looseness Required Between Outer Ring and Housing — As With Self-Contained Bearings.
2. No Possibility of Endwise Cramping of Bearings — A Frequent Cause of Heating and Early Failure.
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5. Precision Limits Used Throughout Permit Extra High Speed Operation.
6. Interchangeable With Standard Single Row Metric Ball Bearings.
7. Available Also in An Extra Light Series Where Overall Weight Is Important.

Norma-Hoffmann Engineers, specialists in bearing design and application, will help you with your problems. Ask for their services.

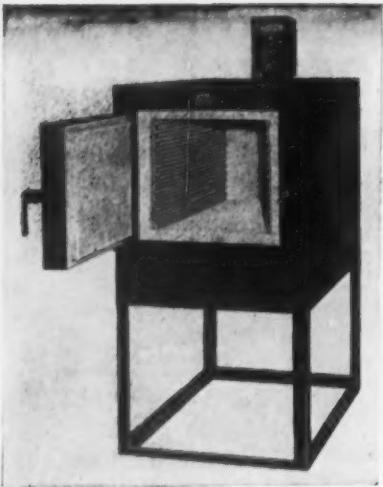


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BALL • ROLLER • THRUST

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| 6x 6x12" | \$500.00 | \$600.00 |
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Complete with 100% automatic electronic controls.

2—Save on Man Hours

Less operator attention needed—Lucifer controls are EXACT. They reach SPECIFIED heat rapidly and retain SPECIFIED temperature without variation. No special experience required when you use a Lucifer Furnace.

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Finest refractory materials are built into Lucifer Furnaces for better, more efficient heat retention. Elements are guaranteed, long lived, trouble free.

WRITE FOR FREE LITERATURE, specifications and price list of Lucifer Furnaces in wide range of sizes—top loading and side loading types. Engineering advice without obligation. Write, wire or phone today.

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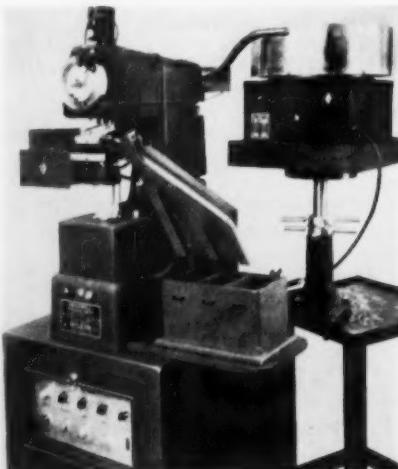
NESHAMINY 6, PA.
Phone Osborne 5-0411

For more data circle 534 on Reader Service Card

ASTE Exposition . . .

word in fully automatic hardness testing, a unit that is being successfully used in industry for quality control checks.

By the use of tiny photo transistors and intricate timing mechanisms, this Rockwell tester is said to be capable of testing the hardness of both ferrous and non-ferrous metals, in hard or soft condition at the rate of up to 1,000 pieces per hour. For automatic operation, the parts to be tested are power fed into the machine through a hopper arrangement and placed in position beneath a diamond penetrator. Testing loads force the diamond into the part in order to determine the Rockwell hardness of the material. The resulting hardness determination, while it can be read on a dial, is used to classify and sort the part according to desired hardness limits. The photo transistor circuit can be set to control the hardness limits as close as two Rockwell points. In addition, the tester



Wilson Automatic Rockwell Hardness Tester

Convert your DRILL PRESS into an Automatic!

SINGLE OR

MULTIPLE SPINDLE

SET RAPID APPROACH
to any length up to 4" + stroke with rapid cycle dial. Saves time. Ideal for jig tumbling.

SET DRILLING SPEED
to material hardness with Feed Valve Dial. Adjusts to an infinite range of speeds. Increases drill and tap life.

ADJUST DRILLING DEPTH
to .002 plus or minus accuracy with micrometer type Depth Dial.

MANUAL LEVER CAN BE USED ANYTIME for manual drilling or guiding in jig tumbling.

**FOR DRILLING • TAPPING • REAMING • THREADING
COUNTER BORING • SPINNING • SPOT FACING • FLY CUTTING**

AIR OPERATED AND HYDRAULICALLY CONTROLLED, the General Automatic Drill Feed is a precision instrument. Carries warranty of parts. Has operated continuously for over 10 years without replacement of parts. Hand and foot pedal release provide dual safety factor. Write for complete facts and new reduced prices to General-Pacific Corporation, 8740 Washington Blvd., Culver City, California.

GENERAL AIR OPERATED-HYDRAULIC CONTROLLED
Multi-Speed DRILL FEED

For more data circle 535 on Reader Service Card

ASTE Exposition . . .

regulates the vertical travel of the elevating screw so that the device can automatically test pieces of varying diameters and thicknesses.

Other units on display will be the regular line of hand-operated Rockwell and superficial Rockwell testers, the Tukon micro-hardness tester and accessories for all models, including the

Equitron fixture which is used for holding pieces that are being tested for Jominy hardenability.

For more data circle 49 on Reader Service Card



DRILL PRESS FEED

In Booth No. 215, Mead Specialties Co., Dept. DP-42, 4114 N. Knox Ave., Chicago 41, Ill., will feature the "Fluid Feed" Air-Hydraulic Drill Press Feed utilizing an oil-flow principle which adjusts rate of feed accurately from 2 to 60 inches per minute. Power is supplied by a double-acting air cylinder and regulated by a small hydraulic cylinder and hydraulic speed control valve. The air cylinder supplies pressure for the downward feed of the drill and returns it to the starting point after it reaches a preset depth. A system of hydraulic checks maintains a uniform speed, regardless of "soft spots" or break-through points, yet allows rapid approach to the work. The new feature of the oil check is said to eliminate the usual needle valve and substitutes a spiral oil duct which can be ad-

YESTERDAY'S PIONEER . . . TODAY'S LEADER



TAPERED

END MILLS CONSTANT SPIRAL

(Die Sinking Cutters)

The extensive line of the well known Weldon End Mills includes Tapered End Mills, Constant Spiral. Also known as Die Sinking Cutters these end mills, filling a definite need, come in a wide range of sizes, giving a choice of many lengths and diameters. Weldon Tapered End Mills as standard stock items are all 3-flute, and offer a choice of $\frac{1}{2}^\circ$, 1° , $1\frac{1}{2}^\circ$, 2° , 3° , 5° and 7° angles, taper on side. They represent the same high quality for which all Weldon End Mills are famous.

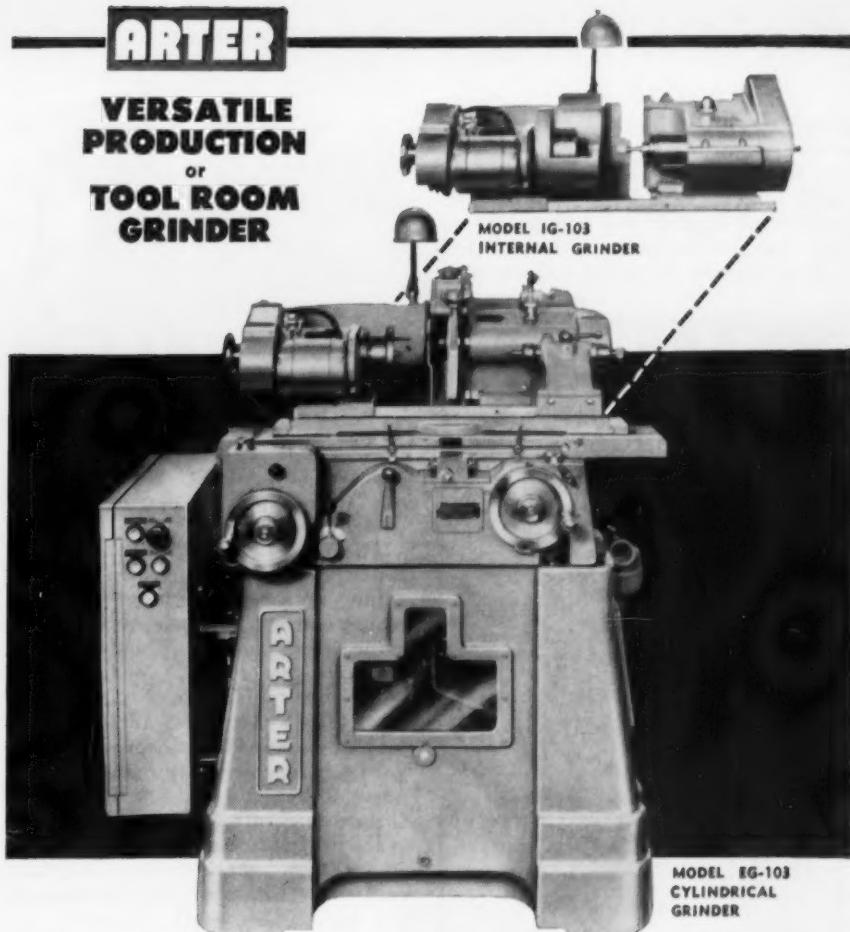
Weldon distributors throughout U. S. A. and Canada carry complete stocks to serve you.

THE WELDON TOOL CO. *Cleveland 4,
Ohio*
3000 WOODHILL ROAD

For more data circle 536 on Reader Service Card

ARTER

**VERSATILE
PRODUCTION
or
TOOL ROOM
GRINDER**



Arter's dual purpose grinder — Internal Grinder or Plain Cylindrical Grinder by simply changing wheelheads. This relatively low-priced grinder, designed for tool room or production work where small-in-capacity machine is needed, can be used as prime equipment or as an auxiliary to larger machines.

ARTER GRINDING MACHINE COMPANY **WORCESTER 5, MASSACHUSETTS**

Jigmatic Automatic Tape Controlled Positioning Table • Rotary Surface Grinders
Flat Circular Cutter Grinders • Internal Grinders • Cylindrical Grinders • Carbide Tool Grinders
AGENTS IN INDUSTRIAL CENTERS OF UNITED STATES AND CANADA

For more data circle 537 on Reader Service Card

ASTE Exposition . . .

justed for speed with great precision. It is also claimed to overcome difficulties due to air bubbles in the oil—bubbles which tend to "vapor lock" the ordinary needle valve when the adjustment is very fine. Furthermore, any air which may be present in the oil collects in a

BREMIL
The IMPROVED Compound Lever Shears

ALL ALLOY
FULLY
GUARANTEED



Two Sizes

PORTABLE

No. 1 cuts up to No. 11 gauge strip or sheet.
No. 2 cuts up to $\frac{1}{4}$ " steel plate.

BREMIL MFG. CO.
1020 Holland St., Erie, Pa.

For more data circle 538 on Reader Service Card

HOWALD CARBIDE MILLING CUTTERS



PATENTED
END MILL



PAT.
SHELL
MILL

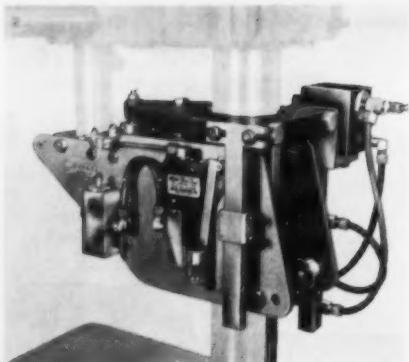
- **SQUARE BLADES**
Easily Replaced.
- Simple, Accurate
Blade Adjustment.
- Lowest Blade Cost.
- Cutters from $1\frac{1}{2}$ "
to 14" dia.

SEND FOR BULLETIN

W. T. HOWALD
MACHINE WORKS

182 SIGOURNEY ST., BROOKLYN 31, N. Y.

For more data circle 539 on Reader Service Card



Mead "Fluid Feed" Drill Press Feed

transparent lucite oil gage, where it can be seen and released occasionally when necessary.

The rate of feed can be accurately determined by the calibrated gage and pointer on the speed control valve, and adjustment can be made while the machine is in operation. The adjustment is coarse—one full turn of the adjusting knob is required to change the feed from 4 to 5 inches per minute, at 50 p.s.i. pressure. The drill press feed operates independently of the working parts of the drill press, and does not require integration with nor alteration of the drill press itself. It can be attached in a few minutes to any standard drill press with cylindrical column of $3\frac{1}{2}$ or $2\frac{3}{4}$ inches in diameter, and spindles of $2\frac{1}{4}$ or $1\frac{3}{4}$ inches in diameter.

CAMS

MADE TO YOUR SPECIFICATIONS

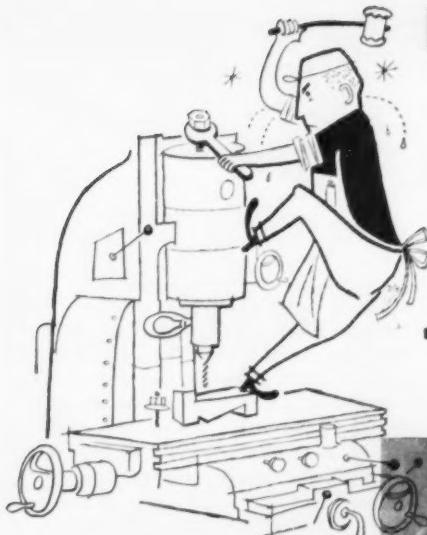
—Except Screw Machine Cams—

Design Assistance Offered

KIDDE PRECISION TOOL CORP.

15 LOCUST AVENUE, ROSELAND, N. J.

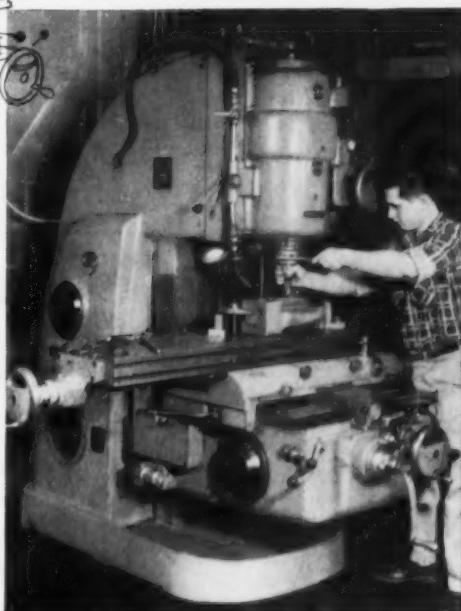
For more data circle 540 on Reader Service Card



HOW MODERN IS YOUR METHOD?

...THIS

... or THIS



The modern P.D.Q. tooling method completely eliminates the time lost in changing old fashioned type tools. No more "sweating out" loosening and tightening the draw bolt. A 60° turn of the lock nut and you're ready for another tool. P.D.Q. tool changes are only a matter of seconds . . . and tools are available in very small, small, medium and large series depending on the application. Write for literature covering all the advantages of modern, cost cutting P.D.Q. (Portage Double Quick) tooling.

BOOTH NO. 669 AT THE ASTE SHOW
REPRESENTATIVES IN PRINCIPAL CITIES



PORTAGE Double-Quick TOOL CO.

1041 SWEITZER AVENUE • AKRON 11, OHIO

For more data circle 541 on Reader Service Card

ASTE Exposition . . .

ter. Two rollers bearing on the drill press column compensate for any side thrust against the spindle or quill.

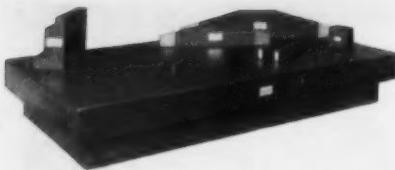
Also displayed will be the company's assortment of air cylinders, valves, impact hammers, work feeders, and so on, many of which will be in operation.

For more data circle 50 on Reader Service Card

★ ★ ★

BLACK GRANITE SURFACE PLATES

In Booth No. 912, a line of uniquely-lapped black granite surface plates will be exhibited by Collins Microflat Co., 2326 E. 8th St., Los Angeles 21, Calif. Seizure of gage blocks and checking fixtures, which has occasionally occurred when using granite surface plates, is said to be eliminated by the unique method of lapping the plates to provide



Microflat Precision Inspection Equipment

a continuous bearing surface interspersed with micronic valleys. These minute reliefs, formed by an exclusive lapping procedure, afford sufficient air pocket relief between bearing surfaces to prevent seizure of instruments. The subdivisions of the grain pattern are so small as to be invisible to the naked eye. Under profilometer check, the plates are now lapped to a finish of from 3 to 16 root mean square.

The entire line of Microflat precision equipment will be displayed, including surface plates, layout plates, toolmak-

"JETLIFT" Combination Portable ELEVATOR and TRUCK



- This handy truck is ideal for loading and unloading delivery trucks, transporting palletized material, moving dies from storage racks and presses. One man can lift and move 2000 lbs. or more with complete safety. Also available with a crane that can be attached quickly and easily.

THE JETROW COMPANY
8407 CLINTON ROAD • CLEVELAND 9, OHIO

For more data circle 542 on Reader Service Card



Here is a completely new electric-hydraulic forcing and straightening press, with construction and operating advantages never before offered in a low-cost shop press.

These are a few of the features:

- ✓ **Rapid Ram Approach**
Automatically changes to power stroke when it contacts the work.
- ✓ **Movable Workhead**
Self-contained—easy to center over the work.
Workhead can be purchased separately.
- ✓ **Variable Ram Speed**
From zero to maximum under fingertip control.
- ✓ **Modern Design**
All operating controls at convenient working height.

**DAKE
PRESSES**

These and dozens of other features are fully described and illustrated in new Bulletin No. 347, which we will send promptly on request.

Dake Corporation • 612 Seventh St., Grand Haven, Mich.

For more data circle 543 on Reader Service Card

ASTE Exposition . . .

**NEW ALLMAN
FLOOR MODEL**



**for toolroom
or production -**

Large T-slot table, machine vise and holding tools—articulate arm (adjustable height) and assortment of tap spindles permit tapping of an infinite number (and number of sizes) of holes without changing set up of work on table. Convenient bench-high bed on Cast floor legs. Movable pedestal has ground column with positioning clamp nut. Spindles guided perpendicular in wide bushing guide.

Write for Circular

TOOLS, INC.

1734 NORTH 25TH AVENUE

MELROSE PARK

*

ILLINOIS

For more data circle 544 on Reader Service Card

282 modern machine shop

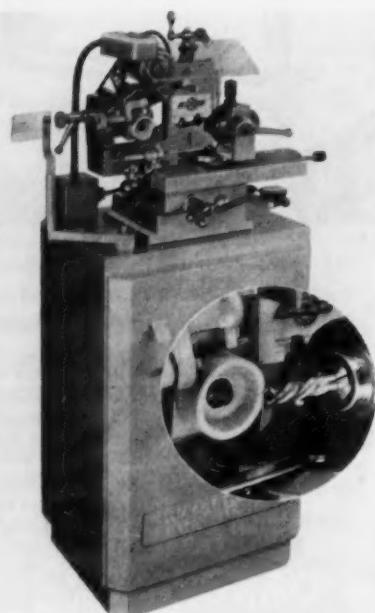
ers flats, angle plates, parallels and straightedges which are accurate to fifty-millionths of an inch.

For more data circle 51 on Reader Service Card

★ ★ ★

END MILL GRINDER

Designated as the "Centra-Point," a new-type grinder for end mills and other small tools will be exhibited in Booth No. 302 by William H. Field Co., Inc., 323 Dorchester Ave., Boston 27, Mass. The machine features a simplified method for grinding helical cutters. According to the manufacturer, a few simple adjustments easily and quickly set the machine up for work. Clearance angles can be read directly



Field "Centra-Point" End Mill Grinder

March, 1956

What do these have in common?



Major components for all of these are pierced in low to medium production quantities at savings of from 60 to 90%—on WIEDEMANN Turret Punch Presses.

Write for a copy of Bulletin 101—or better yet, send drawings of your work for time studies by Wiedemann.

WIEDEMANN MACHINE COMPANY

4219 Wissahickon Ave. P.O. Box 6794 Philadelphia 32, Pa.

For more data circle 545 on Reader Service Card

ASTE Exposition . . .

from calibrations on the wheel head assembly, without reference to tables or constants. Mechanical wheel dressing by built-in diamond truing tools is said to insure a perfect wheel radius for helical grinding.

An operating manual provided with



G E A R S

In Stock—Immediate Delivery

Gears, speed reducers, sprockets, thrust bearings, flexible couplings, pulleys, etc. A complete line is carried in our Chicago stock. Can also quote specific gears of any kind. Send in your blueprints and inquiries.

Send for Complete Catalog No. 20

CHICAGO GEAR WORKS
440-50 N. Oakley Blvd., Chicago 12, Ill.

For more data circle 546 on Reader Service Card



COOLANT MIST GENERATORS

HERE'S the simplest of all mist generators. Splendid results are obtained in all milling, drilling, sawing, tapping, turning or grinding operations. Ideal for lubricating punch press dies; also for applying parting agent to plastic and metal die casting molds.

Needs no special coolant. Produces finer finishes. Increases tool life. Increases production. Systems available for as low as \$30.

Write for circular 1255

AETNA MFG. CO.

192 S. YORK ST.,

BENSENVILLE, ILL.

For more data circle 547 on Reader Service Card

284 modern machine shop

each grinder shows exact machine set-ups for specific types of tools, such as end mills, milling cutters, counterbores, and so on. In sharpening tool steel or carbide cutters, the operator checks recommended machine settings in the manual, attaches the proper tooth rest and the setup is complete. Other features of the "Centra-Point" grinder include a parallel gage and an extra-sensitive carriage movement which enables the operator to "feel" the work. For more data circle 52 on Reader Service Card

★ ★ ★

GEAR MEASURING EQUIPMENT

In Booth No. 544, The Fellows Gear Shaper Co., Springfield, Vt., will display gear measuring equipment only, including the No. 12H Lead Measuring Instrument; the No. 12M Involute Measuring Instrument; the No. 20M Red Liner; the No. 4 Fine-Pitch Red Liner; the No. 12CTR Inspection Instrument; and the Fellows Automatic Pinion Checker.

For more data circle 53 on Reader Service Card

★ ★ ★

SQUARE AND HEXAGON PUSH-TYPE BROACHES

The duMont Corp., Greenfield, Mass., will exhibit its new line of



MASTER GRIPPING C LAWS System Hubner

WHY use them?

1. Clamping action Vertical as well as Horizontal—pressing workpiece down directly on the machine table. No hammering and still no air between. 2. Gain more working room. 3. Faster and more secure setups. Easier to handle. 4. Unlimited jaw opening. 5. No straps overlapping on the workpiece; more machining surface. 6. Extremely versatile—take light cuts or heavy cuts, use on small machines or heaviest production machines. See us at A.S.T.E. Booth 162.

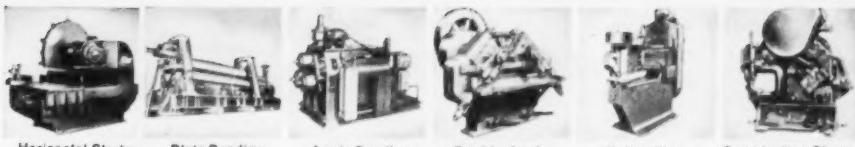
Exclusive Agents

404 - 4th Ave.
N.Y. 16, N.Y., Dept. MMS

KARL A. NEISE

For more data circle 548 on Reader Service Card

March, 1956

Horizontal Stroke
Friction SawsPlate Bending
RollsAngle Bending
RollsDouble Angle
Shears

Rotary Shears

Combination Shear,
Punch & Coper

Your Nearest KLING Distributor will help you win "Production Oscars" with *Kling* Metal Working Machines

In more than 40 cities all over the country, there are Kling distributors who can show you these Kling Metal Working Machines and tell you about the citations they are receiving for production records in "the best of companies."*

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Hinkle Supply Co., Birmingham

CALIFORNIA (Northern)

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(Southern)

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Mine & Smelter Supply Co., Denver Overgard Machinery Co., Denver Joseph T. Ryerson & Son, Inc., Denver

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Triplex Machine Tool Corp.

New York, N. Y.

DISTRICT OF COLUMBIA

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Fairchild Machinery Co., Jacksonville

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(Southern)

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(Central and Southern)

Marshall & Huschart Mch'y. Co., Indianapolis

Joseph T. Ryerson & Son, Inc., Indianapolis

LOUISIANA

Dixie Mill Supply Co., New Orleans

MASSACHUSETTS

Joseph T. Ryerson & Son, Inc., Boston Wiggleworth Machinery Co., East Boston

MICHIGAN

J. L. Hackett Company, Detroit Joseph T. Ryerson & Son, Inc., Detroit

MINNESOTA

Minnesota Steel Supply Co., Minneapolis

Joseph T. Ryerson & Son, Inc., Minneapolis

MISSOURI (Eastern)

Robert R. Stephens Machinery Co., St. Louis

Joseph T. Ryerson & Son, Inc., St. Louis

(Western)

Robert R. Stephens Machinery Co., Kansas City

Joseph T. Ryerson & Son, Inc., Kansas City

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NEW YORK

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Triplex Machine Tool Corp., New York, N. Y.

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VIRGINIA

Noland Company, Newport News

WASHINGTON

Dawson Machinery Co., Seattle Hallidie Machinery Co., Seattle, Spokane, Tacoma

Joseph T. Ryerson & Son, Inc., Seattle, Spokane

WISCONSIN

Joseph T. Ryerson & Son, Inc., Milwaukee John A. Staley Company, Milwaukee

Since
1892

Kling

For more data circle 549 on Reader Service Card

BROS. ENGINEERING WORKS

1326 N. KOSTNER AVE. • CHICAGO 51, ILLINOIS

Exclusive Canadian Distributor: Brown-Boggs Foundry

& Machine Co. Ltd., Hamilton, Ont.

Export Distributor: Simmons Machine Tool Corp.

50 E. 42nd Street, New York 17, N. Y.

1177MMR

ASTE Exposition . . .

standard stock "Minute Man" square and hexagon push-type broaches in Booth No. 1106. Starting with a round pilot, these broaches will finish square and hexagonal holes in a drilled, reamed or cast bore in one pass, in less than one minute. They may be used in either a hand-operated arbor press or a hydraulic press and are available for

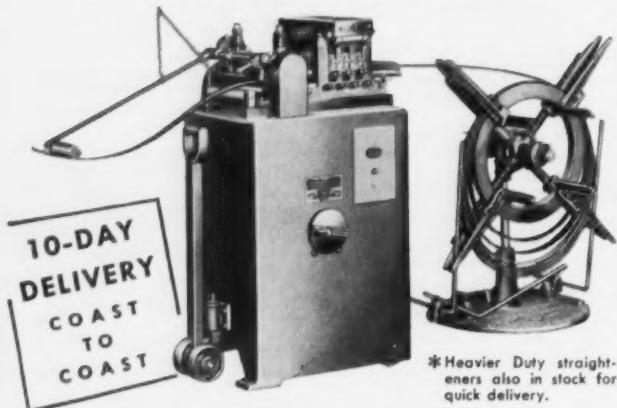


(Top) duMont "Minute Man" Standard Push-Type Hexagon Broach. (Bottom) duMont "Minute Man" Standard Push-Type Square Broach

prompt delivery in eight sizes, for 3/16 to $\frac{3}{4}$ inch holes.

Also on exhibit will be the line of "Minute Man," production - type keyway broaches, newly available as standard stock items. Used with either a hydraulic or hand-operated arbor press, these broaches require no guide or bushing, since the back of the broach is ground to fit the radius of the bore in which it will cut so that the body of the broach supports itself in the hole. These production - type broaches are for $\frac{1}{8}$, 3/16 and $\frac{1}{4}$ inch keyway widths and body diameters from $\frac{1}{2}$ inch to 1 inch by $\frac{1}{16}$ inch size increments.

STRAIGHTEN COIL STOCK from $\frac{1}{2}$ " to 8" wide... from .018" to .065" thick...* on a LITTELL "308"*



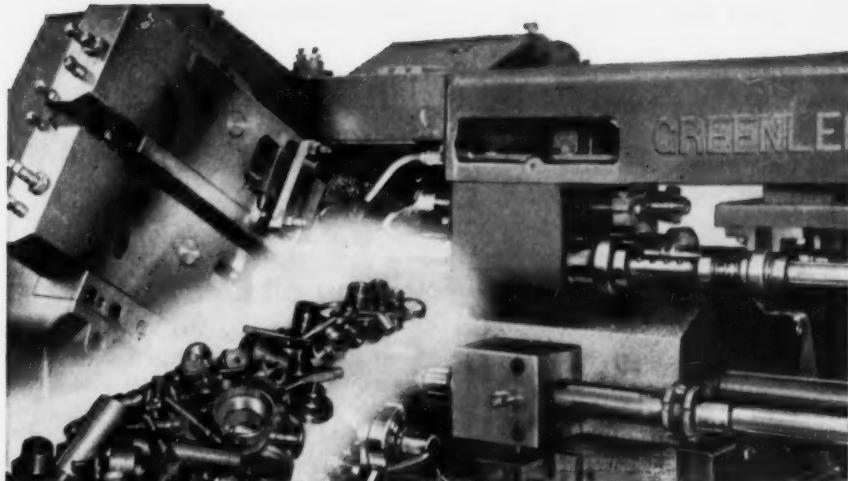
*Heavier Duty straighteners also in stock for quick delivery.

Littell "308" Variable Speed Straighteners flatten coil stock... synchronize feeding of stock with speeds of automatic presses . . . simplify hand feeding. The "308" has brought new speed, efficiency and economy into stamping, blanking and shearing operations from coast to coast. Get full details on these portable straighteners.

Write for Catalog Section 3H



For more data circle 550 on Reader Service Card



PRODUCTION VERSATILITY

ON A GREENLEE 6-SPINDLE
AUTOMATIC BAR MACHINE

Greenlee Automatics provide accurate and fast production of an almost endless range of parts.

Standardized tooling, wide open tooling area, interchangeable cross-slide cams, built-in threading drive, rapid stroke-setting and other Greenlee advantages provide great versatility, assure a quick and generous return on your equipment investment.

PHONE
ROCKFORD 3-4881
TO HELP SOLVE YOUR
PRODUCTION PROBLEMS



For more data circle 551 on Reader Service Card

**Just the thing for
GREASE, OIL, GRIT and GRIME**



**PHLO®
Waterless
Hand Cleaner**

New Waterless Phlo removes all machine shop soils in a jiffy. Contains both silicone and lanolin. Safe, easy to use, Waterless Phlo is milky white, smooth in consistency. New dispenser makes using and refilling a simple matter. Management and workers alike appreciate the time-saving convenience and effectiveness of Waterless Phlo. Keep some at their fingertips always.

**TWO OLD STAND-BYS FOR SKIN PROTECTION
APPROVED AND ACCEPTED BY INDUSTRY**

Practi-Kreme . . . an effective skin protector and cleaner for over 15 years.

Phlo . . . neutral skin protector now fortified with silicones.

*Write today for literature
and free test samples*

THE
Chemical
CORPORATION

85 WALTHAM AVE. SPRINGFIELD 9, MASS.

For more data circle 552 on Reader Service Card

288 modern machine shop

ASTE Exposition . . .

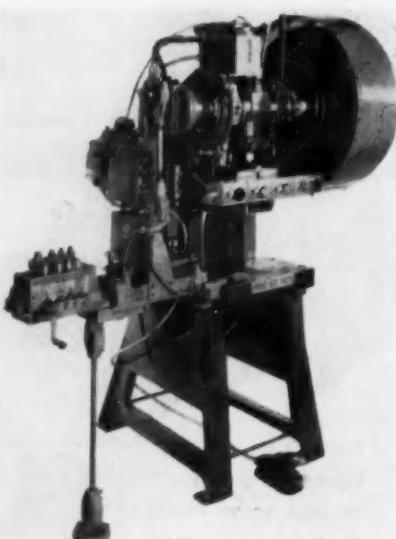
gage bases; "duMont" super high speed ground tool bits, square and rectangular and "duMont" hand-operated arbor presses.

For more data circle 54 on Reader Service Card

★ ★ ★

20-TON O.B.I. POWER PRESS

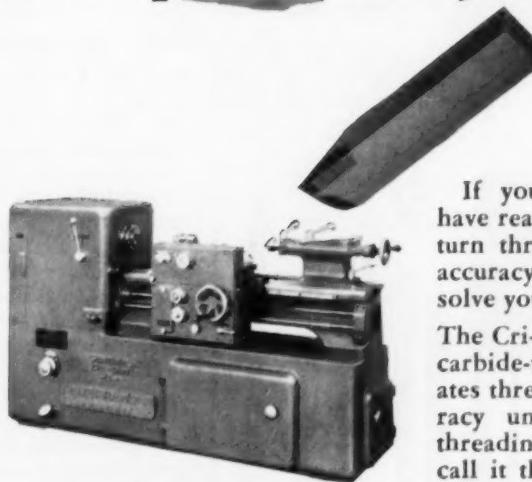
The new Press-Rite No. 2 Power Press will be featured in operation in Booth No. 393 by Sales Service Machine Tool Co., 2355 University Ave., St. Paul 14, Minn. This is a new, economical, 20-ton, high speed, open back inclinable press with operating speeds of up to 300 strokes per minute. Other features of the power press include 1½-inch stroke, solid bronze gibs, automatic lubrication system, special flywheel, air counterbalance, the Press-Rite Airflex air friction



Press-Rite No. 2 Twenty-Ton Power Press

March, 1956

The point of ~~no~~ ^{high} return!



Cri-Dan "B" Single Point, High-Speed Threading Machine CAPACITIES

| | |
|---------------------------------------|-----------------|
| Spindle speed (in 24 steps) | 145-2800 R.P.M. |
| Swing over Saddle | 4" |
| Swing over Bed | 13" |
| Capacity between Centers | 36" |
| Maximum Standard Thread Length | 2½" |
| Rated Capacity | 8TPI - 40 TPI |
| Maximum number of Thread Starts | 12 |
| Maximum Taper Thread | 25° Included |

If your threading operations have reached the point of low return through loss of speed and accuracy, the Cri-Dan "B" can solve your problems.

The Cri-Dan "B" utilizes a single carbide-tipped point that generates threads with speed and accuracy unmatched by any other threading method. That's why we call it the "POINT of High Return".

One example of Cri-Dan's versatility is a facing attachment which enables the Cri-Dan "B" to face and thread in one fast operation.

Your Lees-Bradner representative has all the facts on the amazing Cri-Dan "B". Ask him to show you how your threading operations can become *YOUR* point of high return.

CRI-DAN DIVISION

the **LEES-BRADNER**[®]
Company
CLEVELAND 11, OHIO, U.S.A.

For more data circle 553 on Reader Service Card

ASTE Exposition . . .

clutch and brake, plus the new rotor seal timer limit switch.

Also on display will be a Press-Rite No. 3 Thirty-Ton Press equipped with the Press-Rite Airflex air friction clutch and brake and the new rotor seal timer; the No. 0 Five-Ton and the No. 00 Two-Ton Press-Rite Presses,

the Keller Model 3CH Wet Cut Power Hack Saw with a 6 $\frac{1}{4}$ x 6 $\frac{3}{4}$ -inch capacity; and the new Keller Die Filer.

For more data circle 55 on Reader Service Card

★ ★ ★

GAGES, CENTERS, CHUCKS AND END MILLS

Brown & Sharpe Mfg. Co., Providence 1, R. I., will introduce a number of new industrial products in Booth

No. 374. In addition to the established line of precision-tools, milling cutters and arbors, electronic measuring equipment, screw machine tools, permanent magnet chucks and pumps, some of the entirely new products will be an expanded line of 47 styles and sizes of dial gages, featuring gages with plain and jeweled bearings and shockless models; the "Hite-Chek," a holding post with fine ad-



*any quantity
.... any style*

- A specific type for every carbide drilling application.
- Exclusive features give greater drill life, faster cutting at lower cost.
- Drills available from stock because of high volume production.
- All sizes, solid & tipped carbide.

Write for Complete 92-Page Catalog.

Visit our Booth #122 at A.S.T.E. Show

DEPT. 349 • 21650 HOOVER RD. • DETROIT 13, MICHIGAN

WAREHOUSES: CHICAGO • DETROIT • NEW YORK • LOS ANGELES

For more data circle 554 on Reader Service Card



Brown & Sharpe
Dial-Type Gage



FASTER
circular precision grinding!

Now with this table and with less effort you assure highest standards of accuracy, flatness, finish and close tolerances. At the same time you eliminate slow and complicated tool setups. You cut grinding time greatly by using only cross feed while the table is rotating at infinite speeds between 40 and 100 RPM.



Work clamped to motorized table, mounted on sine plate. Surface grinder application.

For example, Vulcan's Rotary Table can be used in connection with a sine plate or angle fixture. The dressing of large expensive external wheels for side grinding is therefore eliminated. If you wish we can provide permanent magnetic chucks designed for use with our table, both 6" and 10" in diameter.

Vulcan's Rotary Table is an air operated, self contained unit, portable between bench or machine. A precision center hole for locating and tapped holes in the table for clamping provides easy setup. Circular surface grinder applications are many and varied — grind flanged studs or bushings — bearing spacers — forming rolls — cutters — convex or concave surfaces — punches or dies (radius or angle).

Lapping? Yes — and in micro inches. For the 6" and 10" table, lapping plates of 12" and 16" are provided. Perfect for lapping valve plates, gages, bearing spacers and for carbide lapping using diamond powder. *Write for circular.*

Major Vulcan Services

Engineering, Processing, Designing and Building . . . Special Tools . . . Dies . . . Special Machines . . . Vulcamatic Transfer Machines . . . Automation . . . including the Vulcan Hydraulics that Form, Pierce, Assemble and size. Vulcansite Jig Grinders . . . Motorized Rotary Tables . . . Plastic Tooling.

720 LORAIN

VULCAN TOOL CO.

DAYTON, OHIO

For more data circle 555 on Reader Service Card

ASTE Exposition . . .

justment to accurately transfer precision settings; economical small-size bench centers for use where work does not exceed 18 inches in length; two rectangular models (5 x 10 inches and 6 x 18 inches) of permanent magnet chucks which are lighter and lower,

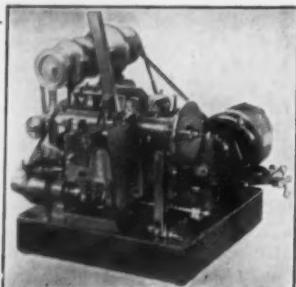
Accurate Hole Transfer Made Easy With **NIELSEN TRANSFER SCREWS**

Simply insert in holes, invert, strike sharply and you have centers and drill circles perfectly located. Reduce time and eliminate spoilage of other methods. B sizes, from $3/16''$ to $1/4''$ U.S.S. Inexpensive — Last for years.



Write for Circular
**NIELSEN TOOL &
DIE COMPANY**
P. O. Box 1067
Berkley, Mich.

For more data circle 556 on Reader Service Card



WALTHAM

Pinion and Gear Cutting Machines

With revolving cutter will make 1, 2 or 3 successive cuts for watch pinions or may be used for fine pitch gears up to $1\frac{1}{2}''$ dia. Blanks are held and indexed by work spindle and usually supported by a tail center. Only straight teeth can be cut.

WALTHAM MACHINE WORKS, INC.

BOX 48 • WALTHAM, MASS.

Pinion and Gear Cutting Machine, Thread Milling Machine, Cylindrical Sub-Presses, Cutter Sharpening Machine, Small thread milling and gear cutters, Small special machinery.

For more data circle 557 on Reader Service Card

with increased magnetic surface and increased holding power; a 1-inch micrometer, with a black frame, which reads by ten-thousandths as well as thousandths of an inch; rolling mill caliper gage, drop-forged to withstand severe use in measuring sheet iron and steel in rolling mills; "Tri-Cal" Universal Vernier Caliper, a tool of three-fold ability that takes outside, inside and depth measurements directly to thousandths of an inch; and double-end end mills of new fast-cutting designs with different diameters at each end of the shaft.

For more data circle 56 on Reader Service Card

★ ★ ★

CONTROLLED CENTERING PRESSURE CHUCK

Horton Chuck, Division of The E. Horton & Son Co., Windsor Locks, Conn., will feature in Booth No. 764 a new centering device specially designed to be incorporated in its line of J-type chucks used in machining jet engine parts. The new "Controlled Centering Pressure Chuck" is said to have the advantage of being able to center at a preset centering pressure thin-walled rings and parts without distorting them during the centering process. The three universal jaws are moved in toward the workpiece and stop automatically when the piece is centered and all three jaws make contact. The 12 independent jaws

AT LAST!

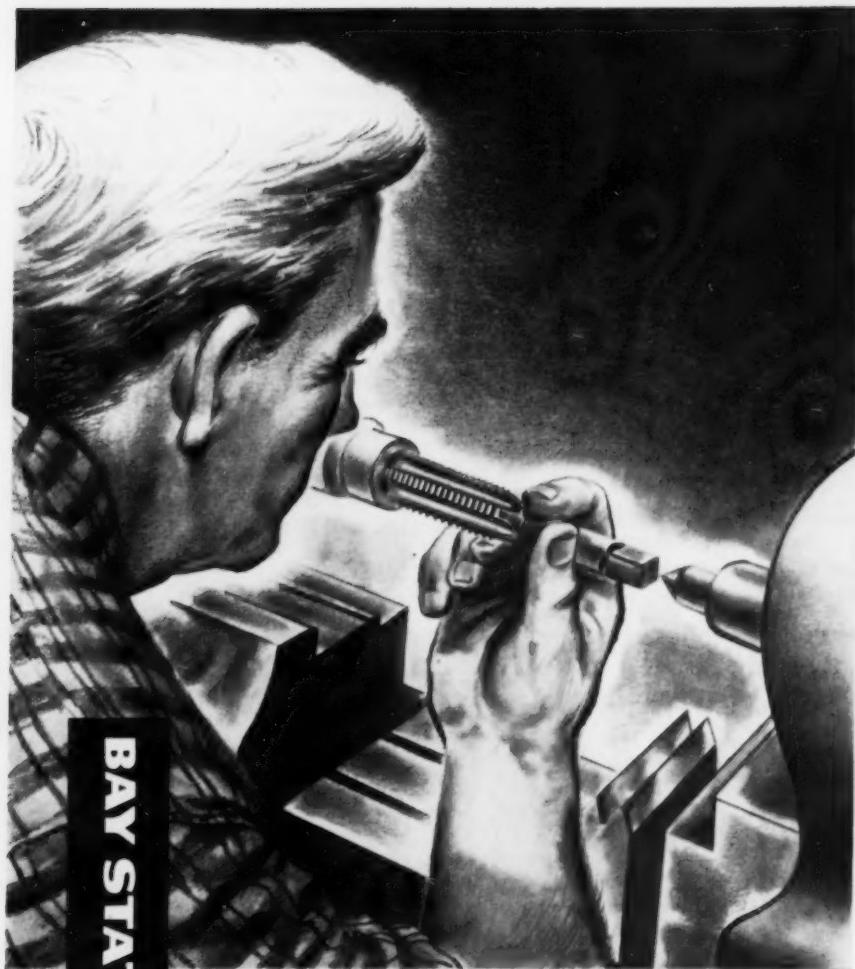
A Low-Priced Dial Type Indicator Has 2 contacts $1/32''$ threaded within $\frac{1}{8}''$. Double Faced. Reads front and back. Two Crystals. Double faced dial Indicator complete with plated holder including $1/32''$ and $1/8''$ contacts —

Black Penetrator . . . \$8.95
No. 4 Superior Magnetic Base and Indicator Holder . . . \$8.95
Thousands of satisfied customers!

SUPERIOR INDICATOR CO.
P.O. Box 734, Rochester 3, N. Y.



For more data circle 558 on Reader Service Card



**BAY STATE
TAPS**

QUALITY COUNTS!

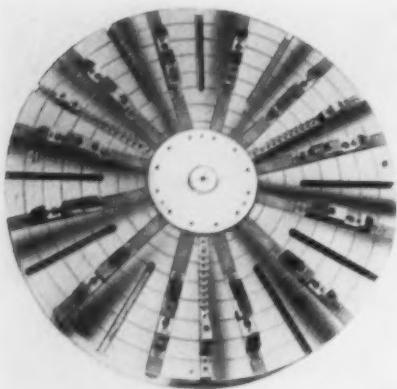
New heights in precision performance can be reached with BAY STATE TAPS . . . and you will find this type of performance waiting for you at your local Industrial Supply Distributor.



BAY STATE TAP & DIE COMPANY
MANSFIELD, MASSACHUSETTS

For more data circle 559 on Reader Service Card

ASTE Exposition . . .



Horton Controlled Centering Pressure Chuck

are then moved in to pinch the part in its "as is" position. This adjustable

centering pressure feature is claimed to save considerable mounting and centering time and completely eliminate the possibility of distortion to the part due to excess pressure applied by the operator. One of the newest design features is the complete and automatic sealing of all jaw ways from chips regardless of jaw position.

Also featured in the display will be two new chuck lines; namely, the "Tru-Set" chuck with an accuracy of 0.0002 inch t.i.r. and the "Windsor" line of independent and universal chucks. Both lines are packed in reusable airtight metal containers.

For more data circle 57 on Reader Service Card

★ ★ ★

OFFHAND TOOL SHARPENING MACHINE

Firth Sterling, Inc., 3113 Forbes St., Pittsburgh 30, Pa., will feature in

To Save You
HOURS of
Detailing
Time...

A New Extended Range of O.D. Symbol Listings For ECONOMY Bushings

ECONOMY'S new "Dimensional Data Sheet No. 7-A" includes an extended range of Standard Drill Jig Bushings by symbol listings up to 5" O.D. by 5" in length.



This eliminates all need for detailing.
You specify by symbol and hole size only.

Ask for "Dimensional Data Sheet
No. 7-A" TODAY!

ECONOMY TOOL & MACHINE CO. 1827 SOUTH 68TH STREET
MILWAUKEE 14, WISCONSIN

For more data circle 560 on Reader Service Card

when mistakes happen...



Automotive crankshaft being brought up to inspection standards with metallizing. This automotive manufacturer formerly used plating for this type of salvage, worked one per hour. With metallizing, the salvage operation requires only 5 to 10 minutes per shaft, including surface preparation.

...and they do in any busy machine shop, there's no need to scrap a mis-machined or otherwise damaged machine part that represents an investment of many expensive man-hours.

Parts like these are brought up to inspection standards quickly, easily and inexpensively with metallizing.

And with the new molybdenum metallizing wire, Sprabond, the only surface preparation required is cleaning. The molybdenum forms a molecular bond with the surface being rebuilt. Little heat is generated, eliminating any danger of warpage.

What's more—users have found that the extreme hardness of the molybdenum coating, and its microscopic porosity which provides superior lubricating characteristics, improve its "wear-ability" over ordinary bearing surfaces as much as 25 times. You haven't just salvaged a part—you've improved it.



Free Bulletin

Get the full story on metallizing in production salvage. Bulletin 57-C describes and illustrates the procedures, provides data on typical parts, with interesting photo-micrographs showing the unique bonding action of Sprabond Wire. Send for a copy.

The trade name, SPRABOND WIRE, is the property of Metallizing Engineering Co., Inc.

DON A. WATSON
METALLIZING ENGINEERING CO., INC.
1111 Prospect Ave., Westbury, Long Island, N. Y.

- Please send me Bulletin 57-C.
 Please have Metco Field Engineer call.

Name _____

Company _____

Street _____

City _____ Zip _____ State _____



Metallizing Engineering Co., Inc.

1111 Prospect Ave., Westbury, L. I., New York • cable: METCO
In Great Britain:
METALLIZING EQUIPMENT COMPANY, LTD.—Croydon near Woking, England

For more data circle 561 on Reader Service Card

PROTECT METAL TOOLS & PARTS IN SHIPPING, HANDLING OR STORAGE



Thermo-Cote

STRIPPABLE
PROTECTIVE COATINGS
provide

- RUST PREVENTION
- CUSHION PROTECTION
- HERMETIC SEAL

Crystal clear for instant identification or inspection. Low cost — reusable.

Gov't approval to Spec. JAN C-149.

Write for special introductory offer or send samples for free evaluation.

BISCHOFF CHEMICAL CORP.

105 MAIN STREET, IVORYTON, CONN.

For more data circle 562 on Reader Service Card

296 modern machine shop

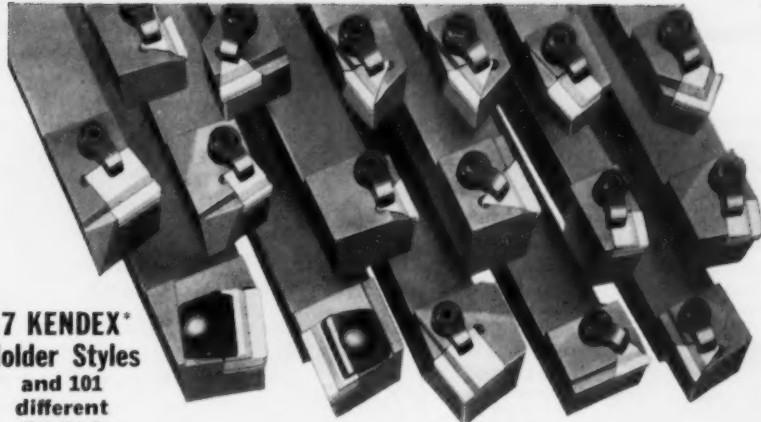
ASTE Exposition . . .

Booth No. 528 the Method X Offhand Tool Sharpener, an electro spark process for sharpening and modifying cutting tools. Developed and perfected by the Method X Company, a subsidiary of Firth Sterling, this offhand tool sharpening removes both carbide and shank simultaneously. Metal is removed from the tool by an electric spark crossing the gap between a cast iron wheel, acting as the electrode, and the tool which is separated from the wheel by a semi-solid dielectric film. Because the film prevents contact between the wheel and tool, wheel wear is negligible, and damage to the wheel or tool is impossible. The sharpener eliminates the need for diamond or any other abrasive grinding. Both roughing and finishing are performed on the same wheel, eliminating the need for two operations. The Method X Tool Sharpener is being



Method X Offhand Tool Sharpening Machine

March, 1956



17 KENDEX®
Holder Styles
and 101
different
TOOLS

KENNAMETAL[†] today offers the tooling for tomorrow

Kendex Button and Heavy Duty tools can truly be considered as the "Tooling for Tomorrow."

Kendex holders are simple and rugged in construction; fitted with trouble-free, interchangeable "hardware"; accommodate square, round and triangular turnover, throw-away button inserts that eliminate costly grinding . . . all features needed to keep tomorrow's high speed, highly synchronized production lines on the go—hour after hour.

"Tooling for Tomorrow" must face up to varied cutting jobs, on many types of machines . . . machines that will require quick, accurate tool changing for close tolerance work at high speeds and low costs per piece. Kendex tooling was designed for such conditions. In addition, it increases efficiency; lowers tool investments; sharply reduces maintenance costs. There are over 100 Kendex tools and 35 different Kendex inserts—some stocked in as many as six Kennametal grades.

Why not have a Kennametal tool engineer help you step up efficiency on today's jobs with Kendex "tooling for tomorrow." He works exclusively with Kennametal tooling . . . applying and servicing it. This specialized experience is yours for the asking. KENNAMETAL INC., Latrobe, Pennsylvania.

*Registered Trademark; Patent applied for
†Registered Trademark

A-9438A

For more data circle 563 on Reader Service Card



INDUSTRY AND
KENNAMETAL
...Partners in Progress

ASTE Exposition . . .

manufactured by the Ex-Cell-O Corporation under license granted by the Method X Company.

Also displayed will be "Firthite" TXH, a heavy-duty, general purpose premium carbide which is available at no premium price. According to the

manufacturer, the outstanding features of TXH are high hardness to strength ratio; improved impact resistance; wide range of applications; cool operating temperatures; high edge strength; and unusual resistance to abrasion.

For more data circle 58 on Reader Service Card

★ ★ ★

O-RING AND RETAINING RING GROOVING TOOLS

In Booth No. 136, Bokum Tool Co., 14775 Wildemere Rd., Detroit 38, Mich., will display two of its newest tools—O-ring and retaining ring grooving tools. Also to be featured will be new swing tool holders, as well as a new adjustable tool holder for turret lathes. In addition, the company will show standard boring and turning tools in super high speed steel, carbide tipped and solid tungsten carbide.

For more data circle 59 on Reader Service Card

★ ★ ★

AIR VISES

Production Devices, Inc., Whitehall, N. Y., will exhibit various "Airlox" air vise models in Booth No. 795. An improved Model S-30 "Airlox" Vise will be included in the exhibit, the improvement being the installation of the pressure grease system in the movable vise jaw. This is an exclusive feature now being furnished in the other "Airlox"

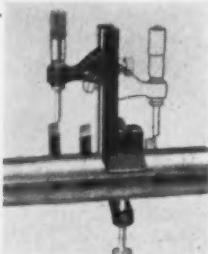
You Can
SAVE
TIME
and Do
BETTER
WORK
with Bartelt's Versatile
PEDESTAL
MICROMETER

• Use it for setting boring tools and for many other shop operations requiring accurate positioning relative to a fixed base. Make settings in ONE step — eliminate cut-and-try methods. Model B, with reversible slide, shown.

Write for Complete Literature

BARTELT ENGINEERING CO.
1216 PARTRIDGE AVE. • BELOIT, WIS.

For more data circle 565 on Reader Service Card



Now...
carried in
stock..



A complete line of carbide tipped combination ream, counter-bore and facing tools to machine standards.
AND 10050
Porting Tools
Combines 5 operations in one tool! Thoroughly proven.

WETMORE TOOL & ENGINEERING CO.
5320 E. WASHINGTON BLVD., LOS ANGELES 22, CAL.

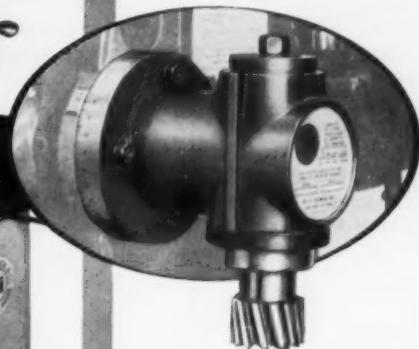
For more data circle 566 on Reader Service Card

ASTE Show, Chicago, Booth 351



THE
Nichols
TOOL ROOM
MILLER

"the miller that uses its head!"



A valuable accessory is the Nichols Heavy-Duty Vertical Milling Attachment. Takes full 1½ H.P. up to 2000 R.P.M. (So precise, some shops use it for jig boring!)

CONDENSED SPECIFICATIONS

| | |
|---|-----------|
| Table Working Surface | 8½" x 30" |
| Longitudinal Travel | 19" |
| Transverse Travel | 7" |
| Vertical Travel—Knee | 13¾" |
| Rise and Fall of Spindle | 4¾" |
| Selective Speed Range up to 3000 R.P.M. | |
| Weight | 1250 lbs. |

Write today for Nichols general catalog which describes the six models of Nichols Millers. A sound, color movie, "The Miller that Uses its Head" is available for free showing. May we reserve it for you?



The unusual versatility and extra capacity of this model make it extremely useful for the tool room. Because it is equipped with the "rise-and-fall" spindle, it can perform not only conventional precision milling, but also facing, boring, key seating, contour milling and other operations. Both longitudinal and transverse feed screws are fitted with hand wheels and extra-large adjustable micrometer dials with easy-to-read graduations. This model is especially useful because of its compactness, generous capacity and ability to handle a wide variety of work to close tolerances — to "tenths" when desired!

MANUFACTURED BY W. H. NICHOLS COMPANY • WALTHAM, MASSACHUSETTS

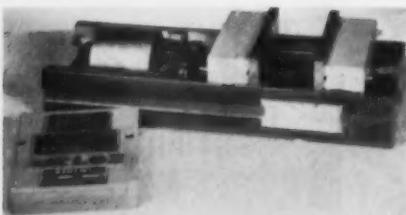
NATIONAL DISTRIBUTORS

NICHOLS-MORRIS CORPORATION

76-H Mamaroneck Ave.
White Plains, N. Y.

For more data circle 567 on Reader Service Card

ASTE Exposition . . .



Improved "Airlox" Model S-30 Pneumatic Vise

Senior Vise models. Each time that grease is applied to the fittings on the movable jaw, not only is the jaw completely lubricated, but any dirt, chips or foreign matter is pushed out from under the jaw. This means that the problem of chip clogging in power vises has practically been eliminated. This pressure grease system, plus the pat-

ented wedge with levers "Airlox" mechanism, is claimed to make the vises ideal for work-holding on milling operations. Vise grip up to 10 tons is available on various vise models.

A new product, called the "Airlox" Power Head, will be exhibited for the first time.

For more data circle 60 on Reader Service Card

★ ★ ★

SPEED CONTROL VALVES

Hanna Engineering Works, 1758 Elston Ave., Chicago 22, Ill., will feature its "Flo-Set" line of speed control valves in Booth No. 366. These valves are used for controlling speeds of air and hydraulic cylinders and for regulating the flow of fluids. The valves permit forward stroke speeds to be adjusted independently of reverse cylinder strokes. Aluminum and stainless steel combine to give the valve light weight

★ ★ ★ ★ ★

A good machinist
looks first to the
COLLET!...and
first in COLLETS is

RIVETT!

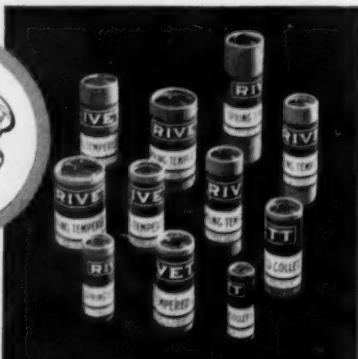
Stocked in all standard styles for immediate delivery. Fractional round sizes and decimal equivalents from 1/64" to capacity; square, hexagon and taper holes. Transparent packaging for easy identification.



Write for Bulletin 100E

RIVETT LATHE & GRINDER, INC.
Dept. MMC3, Brighton 35, Boston, Massachusetts

For more data circle 568 on Reader Service Card



Collets for all lathes including American, Atlas, Axelson, Cincinnati, Hardinge, LeBlond, Lodge & Shipley, Logan, Rivett, Rockford, Sheldon, South Bend.

Sesco

positive holding

CAM CLAMPS

THEY MAINTAIN POSITIVE HOLDING
PRESSURE—NEVER LOOSEN . . .

The effective clamping range solves the problem of variations in stock thickness up to $\frac{1}{4}$ " and eliminates troublesome readjustments.

LAST INDEFINITELY . . .

- because of heavy steel construction and precision assembly.
- singly, or in multiple, on any machine tool, or operation.
- and withstands severe vibrations, even on milling operations.

AND, THEY'RE
AVAILABLE FROM
STOCK IN 4 STANDARD SIZES . . .

- with maximum holding pressure up to 1600 lbs.
- and, 2 larger sizes are available on special order—with holding pressure up to 8000 lbs.



Patent No.
2,537,594

Sesco

INC.

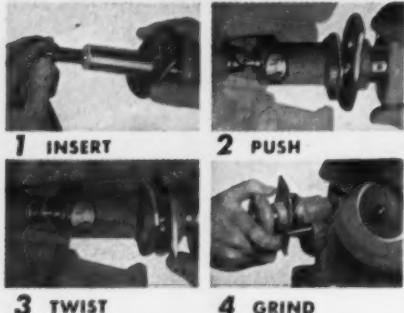
8881 Central
Detroit 4, Michigan

engineers & manufacturers
of machine tools and
press room equipment

For more data circle 569 on Reader Service Card

STOP WASTING DRILLS

NEW LIFE for **OLD DRILLS** with
BLACK DIAMOND DRILL GRINDER



The BLACK DIAMOND Drill Grinder restores a worn drill to like-new precision sharpness . . . in 10 seconds! Any inexperienced man

(or woman!) is an expert grinder with this unit. Both lips ground at once . . . web-

thinning equally simple! Pays for itself many times over!

Also manufacturers of the Worcester Drill Grinder for drills up to 2½".

FREE BULLETIN

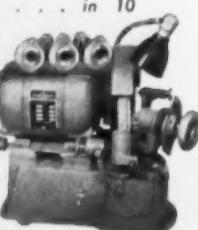
Get all the facts! 4 page illustrated bulletin gives complete story. Write Today!

BLACK DIAMOND

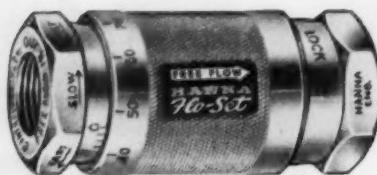
SAW &
MACHINE WORKS

For more data circle 570 on Reader Service Card

302 modern machine shop



ASTE Exposition . . .



Hanna "Flo-Set" Speed Control Valve

and durability. The valve is rated for 250 p.s.i. air and hydraulic service. One revolution of the valve body controls flow from zero to full opening.

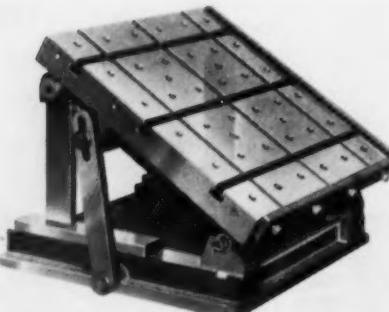
Universal mounting brackets and a universal trunnion will be featured accessories for Hanna T750 Series Fluid Power Cylinders. These universal mountings compensate for the most common cause of cylinder failure — misalignment with the work load.

For more data circle 61 on Reader Service Card

★ ★ ★

ANGULAR TOOLING EQUIPMENT

A complete line of angular tooling equipment will be exhibited in Booth No. 416 by Omer E. Robbins Co., 24800 Plymouth Rd., Detroit 39, Mich. The



Robbins 12-inch Square Sine Plate

March, 1956

**INCREASES
PRODUCTION...**

LOWERS COSTS...

**PAYS FOR ITSELF
QUICKLY...**

The ROUSE HAND MILLER is a widely used, inexpensive, high speed, ball bearing, motor driven machine for handling light cuts in brass, aluminum, steel, plastics, and other materials—fast, accurately, and at very low cost. Only \$110.00*

Fixtures (illustrated) extra.

Motor equipment:— $\frac{1}{4}$ H.P., 110 Volt AC 60 cycle, single phase, swivel motor mount and light—\$36.00*

*All prices FOB Chicago.



- ★ MILLS SMALL PARTS MUCH FASTER.
- ★ DRASTICALLY CUTS YOUR INVESTMENT IN EQUIPMENT. Replaces expensive production machinery—or releases it for other jobs.
- ★ INEXPERIENCED HELP CAN OPERATE IT. Safe, simple, fool-proof operation.
- ★ NO MORE COSTLY SET-UP TIME. \$110.00* price so low that it pays to keep one or more Hand Millers always set-up for special operations.
- ★ YOU GET A BETTER PRODUCT—the result of ABSOLUTE ACCURACY.
- ★ A LOSS BECOMES A PROFIT when marginal pieces are finished on the Hand Miller instead of on high cost equipment.
- ★ VERY LOW MAINTENANCE.
- ★ USED REGULARLY IN 1163 MANUFACTURING PLANTS (some of which use as many as 30 machines)—yet on the market a scant few years.
- ★ UNIQUE—VERSATILE. Nothing else like it. One or several machines can be the answer to some of your production problems.

Write today
for further
information.

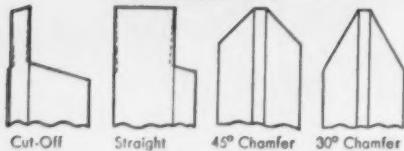
H. B. ROUSE & COMPANY
2214 N. WAYNE AVE., CHICAGO 14
50 YEARS OF SERVICE TO INDUSTRY

For more data circle 571 on Reader Service Card

NOW

DAVENPORT FORM TOOLS

and blanks
are standard
at **Somma**



Davenport form tools and blanks are now available without the extra cost or delay of "specials".

Somma saves on delivery time and cost of circular form tools for Davenport screw machines by adding them to the long list of standards carried in stock for immediate delivery.

Write for new catalog and name of Somma Tool distributor in your area for prompt service on standard circular form tools for Brown and Sharpe screw machines as well as Davenports.

Somma
TOOL CO., INC.

20 BROWN STREET, WATERBURY, CONN.
West Coast Warehouse: 576 N. Prairie, Hawthorne, Cal.
For more data circle 572 on Reader Service Card

304 modern machine shop

ASTE Exposition . . .

line includes heavy-duty sine plates for angular machining, the "Magna-Sine" Magnetic Sine Table for angular grinding and an inspection sine plate. All of this Robbins equipment has been redesigned during the past year. Prominent among new features is the patented "Perma-Flat" Swivel Block, which is said to insure greatly extended service life, both for the equipment and the precision gage blocks which are used with it. New sizes have also been added to the Robbins line of precision equipment, designed to save set-up time and improve accuracy on all angular work in the tool room.

For more data circle 62 on Reader Service Card

★ ★ ★

**IMPROVED GUIDE PINS
AND BUSHINGS**

New guide pins and bushings, engineered to improve die set accuracy, appearance and performance, will be introduced in Booth No. 396 by The Producto Machine Co., 910 Housatonic Ave., Bridgeport 1, Conn. Producto guide pins have been improved with greater press fit lengths, smoother and radii and mirror-like surface finish of 7-9 micro-inches. The master bushings have five new design features: new standards for relief, which give greater bearing surfaces and improve accuracy; ground shoulders, which seat bushings square to punch holder, affording perfect alignment; ground lead on press fit, which starts bushing into punch holder easily; double figure 8 oil grooves, fed by grease fitting, to provide a constant source of lubrication to pin and bushing (optional spring-loaded grease cups available); and tumble-blasting of all unground surfaces, which polishes surfaces in areas normally not finished after hardening.



March, 1956

in MILL HEADS

RUSNOK

Builds the **BEST** Quality
at the **BEST** Price

1/4 H.P. CONVERTICAL MILL HEAD

Only low cost mill head with quill travel attachment.

High speed medium-light operation.
For bench, floor and pedestal mills.

Fits milling machines with overarm 1½" to 3".
¾" end mill capacity.

\$245.00



RUSNOK

1/2 H.P. MILL HEAD

HEAVY DUTY MILLING ATTACHMENT

Fits milling machines with 3" to 5" overarm.

¾" end mill capacity.

For vertical, horizontal and angular operations.

1 H.P. MILL HEAD

HEAVY DUTY MILLING ATTACHMENT

Fits milling machines with 3" to 5" overarm.

¾" end mill capacity.

For vertical, horizontal and angular operations.

RUSNOK

RUSNOK TOOL WORKS

4840 West North Ave., Chicago 39, Ill.

DEALERS IN ALL PRINCIPAL CITIES

MILLING • DRILLING • BORING

For more data circle 573 on Reader Service Card

ASTE Exposition . . .



View of Products Improved Guide Pin

In addition to these new-design pins and bushings, the company will display its complete line of catalog and special

die sets, diemakers' accessories, vises, feeding devices and other toolroom equipment.

For more data circle 63 on Reader Service Card

★ ★ ★

POWER CYLINDERS, BOOSTERS AND SEALS

Miller Fluid Power Co., 2024 N. Hawthorne Ave., Melrose Park, Ill., will exhibit its line of power cylinders, boosters and seal fittings in Booth No. 429. The power cylinders with the following new quality features are offered at no extra cost on standard Miller catalogued cylinders; case-hardened, chrome plated piston rods; "Teflon" rod wipers and "Teflon" hydraulic rod seals; and rust-resistant black ferric oxide finish on cylinder heads, caps, mountings, pistons, followers, tie rods, and the unplated portions of the piston rods.

The development of double-acting reciprocating boosters which, with shop air, cycle continuously to supply a constant flow of oil for hydraulic cylinder operation will be displayed. Miller's famous "College of

ELGIN
GOLDEN-CIRCLE
ROTARY TOOLS

backed by ELGIN'S reputation
for quality leadership

Here is a new performance-tested line . . . burs and rotary files, carbide or high-speed steel, shapes and sizes to meet every need. They're precision-made and proudly marked with the Golden-Circle symbol of dependable ELGIN quality. Write for your copy of the "Golden-Circle" booklet today!

FREE BOOKLET

see how many operations can be made easier and faster. See how many shapes and sizes are made to meet your need.

ABRASIVES DIVISION, DEPT. P

ELGIN NATIONAL WATCH COMPANY
ELGIN, ILLINOIS

For more data circle 574 on Reader Service Card

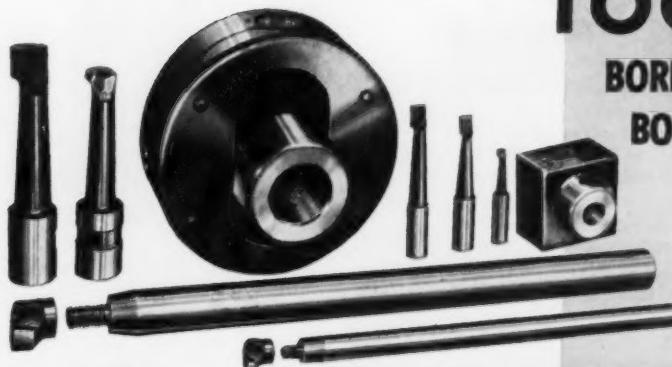
for more *Accurate* cuts...

greater *Rigidity* in

BORING TOOLS

BORING HEADS

BORING BARS



Use CRITERION BORING EQUIPMENT

BORING PROBLEMS? CLOSE TOLERANCE?

Try Criterion Boring Tools. Built with the same care and quality as the time-tested Criterion Boring Head.

THIS COMBINATION WILL PRODUCE RESULTS.

Boring heads from $\frac{1}{2}$ to 7 inch diameter. Boring tools, carbide or high speed steel, $\frac{3}{8}$ to $1\frac{1}{4}$ inches diameter. Bore holes from $\frac{1}{8}$ to 20 inch diameter.

Accuracy for the closest tolerance • Rigidity for the heavy cuts • Heat-treated parts for long wear

LARGE OFFSET SAVES TIME AND TOOL CHANGES

These tools will cut your boring costs.

See the complete line of CRITERION TOOL PRODUCTS at your local dealers or write for free catalog.

**CRITERION
MACHINE WORKS**

765 WEST 16TH ST. • COSTA MESA, CALIF.

For more data circle 575 on Reader Service Card

ASTE Exposition . . .

"Cylinder Knowledge" has been revamped and expanded to more completely demonstrate valuable information on cylinder operation, efficiency, elimination of maintenance, increased production, and so on. A new threaded seal-

CAMS

Fully equipped modern machine shop with extensive Jig Boring, Surface Grinding, Horizontal Boring and Thread Grinding facilities as well as modern Cam Milling and Cam Grinding equipment.

Your Inquiries Answered Promptly

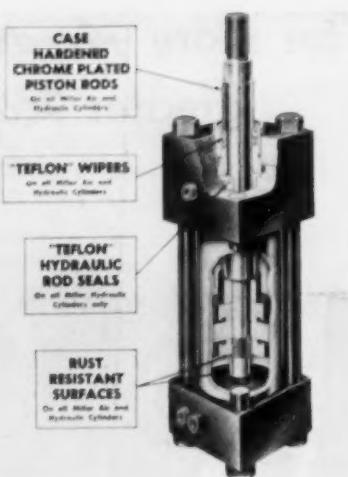
HIMOFF MACHINE CO., INC.
23-16 44th Road Long Island City 1, N. Y.

For more data circle 576 on Reader Service Card



**LEADING NAME IN
BORING HEADS FOR 40 YEARS**
19 MODELS Write for catalog
FLYNN MANUFACTURING CO.
133 FLOWERDALE AVE. • DETROIT 20, MICH.

For more data circle 577 on Reader Service Card



Miller Standard Power Cylinder Features

fitting, which eliminates present and future leaks of oil, air, gas, water, chemical fluids, and so on, at pipe threads and other threaded connections, will round out the exhibit.

For more data circle 64 on Reader Service Card

★ ★ ★

OFFSET BAR AND TUBE PRINTER

Designated as the No. 246, a new automatic printer for bars, tubes, pipe, non-collapsible hose and heavy wire, will be shown in Booth No. 662 by Jas. H. Matthews and Co., 3944 Forbes St.,

Quick Shipment on

TAPER ATTACHMENTS

For All Lathes—Old or New—
9" to 36" Swing
Write for Bulletin

MASTER-TAPER COMPANY
4531 N. BEACON ST., CHICAGO 40
EXCL. Mfrs. of Taper Attachments

\$29.50
to
\$149.50

For more data circle 578 on Reader Service Card

RACINE®

20"
X
20"
METAL
CUTTING
MACHINE



EXTRA CAPACITY AT LESS COST

The Racine 20 x 20 has a two inch greater capacity at a 31 to 37% investment saving.

Rugged, simple construction with complete, modern hydraulic controls.

A single lever controls all operations.

All parts are easily accessible.

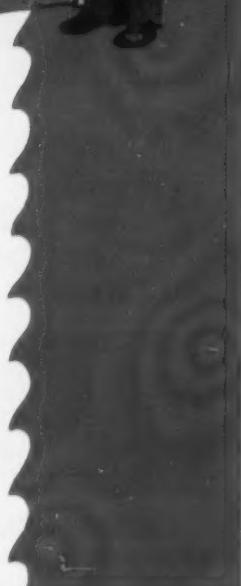
Dual 100% progressive metered
Positive and flexible feed

Write for catalog and prices of complete
RACINE line, including single purpose,
special and fully automatic models, capaci-
ties from 6" x 6" to 20" x 20".



RACINE HYDRAULICS & MACHINERY, INC.

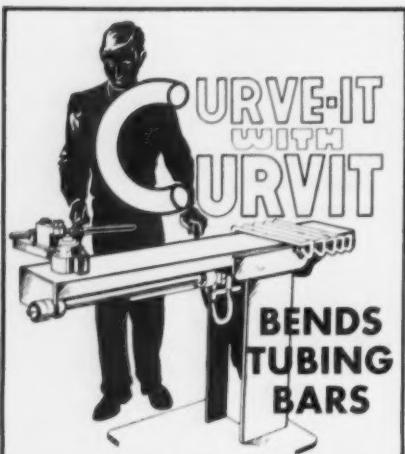
2070 Albert St., Racine, Wisconsin



For more data circle 579 on Reader Service Card

ASTE Exposition . . .

Pittsburgh 13, Pa. The machine is designed for production-line marking of from $\frac{1}{2}$ to $6\frac{1}{2}$ -inch diameter stock, in any length, at speeds up to 300 linear feet per minute. Equipped with V-rollers for guiding passing stock in the proper position for marking, this unit



CURVE-IT WITH CURVIT
BENDS TUBING BARS
with less fatigue **FASTER!**

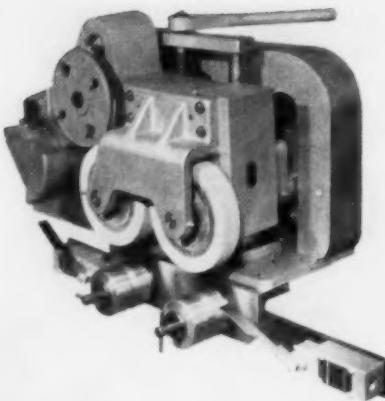
- AIR OPERATED
- SIMPLE SET UP
- BENDS FLAT OR ROUND

WILL MAKE THESE SHAPES



KILHAM ENGINEERING INC.
R.F.D. NORTH ATTLEBORO, MASS.
MYrtle 5-6211

For more data circle 580 on Reader Service Card
310 modern machine shop



Matthews 246 Offset Bar and Tube Printer

features a synchronized, indirect (offset) printing mechanism, which transfers ink from a pick-up roll to the type faces, than to a smooth-surfaced rubber printing roll which transfers the type image to the material being marked, each revolution printing a maximum of 24 inches along the stock. Type setups are quickly interchangeable.

The No. 246 features a single adjustment for different diameters of stock, a dip-style fountain, which permits using pigment-type inks, and its entire printing mechanism is synchronized to prevent "off-register" printing, slippage and distortion of the rubber type. The offset printing roll not only eliminates wear resulting from type-to-stock



Buy safe "SHUR-GRIP"

drop forged HANDLES

Designed to hold 3 to 6 lb. lead hammer heads more firmly — will not slip — keeps hammer head in shape longer — makes re-molding easier, quicker, surer, less expensive.
Write for circular and prices

LAWRENCE H. COOK, INC.
67 MASSASOIT AVENUE, EAST PROVIDENCE 14, R. I.



For more data circle 581 on Reader Service Card
March, 1956

Get the complete, revealing

Inside Story

on the finest
tapping heads ever made!

Here's a feature by feature analysis on the amazing Procunier tapping line which clearly explains why they have consistently maintained tapping superiority in the industry for over 30 years! A true "peep-hole" story on the many outstanding construction improvements, the mechanical advancements and precision quality operating advantages that make Procunier heads a "must" in production plants everywhere! You'll learn why Procunier means more tapping hours with a minimum of "down-time" interruptions, accelerated production with fewer broken taps, fewer spoiled pieces and a "new-found" operating ease and convenience that helps operators maintain stepped-up production schedules. "Do more tapping, better, for less" is the slogan in progressive plants who have adopted Procunier heads in their tapping departments.

Find out how you, too, can benefit
with Procunier — Write for Free
Brochure Today

SEE US AT THE A.S.T.E. SHOW
BOOTH 1701

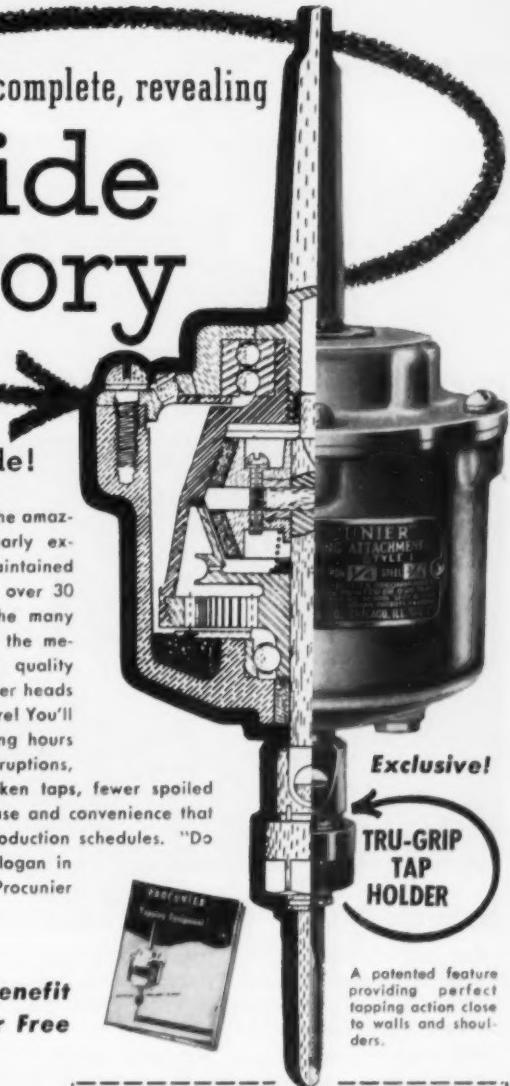
PROCUNIER SAFETY CHUCK COMPANY

12 S. CLINTON ST., DEPT. 3
CHICAGO 6, ILL.

For more data circle 582 on Reader Service Card

March, 1956

modern machine shop 311



A patented feature
providing perfect
tapping action close
to walls and shoul-
ders.

PROCUNIER SAFETY CHUCK CO.

12 S. Clinton St., Chicago 6, Ill., Dept. 3

Gentlemen: Please send your illustrated brochure giving complete details, specifications and prices on the improved line of Procunier High Speed Tapping Heads.

Name _____

Address _____

City _____ Zone _____ State _____

ASTE Exposition . . .

contact, but it also compresses slightly in its center to print large characters on small diameters of stock. In addition to friction-driven models actuated by passing stock, the No. 246 may be designed to pick up power from users' production equipment, or it may be supplied with a geared-head motor for

printing off the production line. The entire unit occupies less than 3 feet of space.

For more data circle 65 on Reader Service Card

★ ★ ★

HIGH PRODUCTION HONING TOOLS AND ABRASIVES

In Booth No. 1127, Barnes Drill Co., 860 Chestnut St., Rockford, Ill., will exhibit its line of high production honing tools and abrasives. The principal features of these H-S (Slotted body) Honing Tools are the direct body support of the stone near the cutting face and the full support of the expansion pressure to the stone. The Barnesdril

FEEDMATIC ROTARY HOPPERS



lower your production costs!

Cut your assembly costs . . . speed production . . . eliminate slow, costly hand feeding. Feedmatic rotary hoppers automatically deliver small parts in proper position for assembly over attached feed tracks.

Use Feedmatic hoppers for high speed delivery of parts to machine tools, grinders, special production machines—or for sorting, counting and inspection operations.

Wherever high volume production is required, it will pay you to investigate the many cost-saving advantages of Feedmatic Rotary Hoppers. Write today, and send samples of your small parts.

FEEDMATIC, INC.

26907 WEST SEVEN MILE RD
DETROIT 19, MICHIGAN

For more data circle 583 on Reader Service Card



Barnesdril Model
HF-8 High Production
Honing Tool



save money minutes, metal

with
**B&W MECHANICAL
TUBING**

CARBON • ALLOY • STAINLESS



Countless hollow parts and products now being made from solid stock can be fabricated more economically from tubing. The hole is there, eliminating heavy drilling with all its attendant waste. And the wide range of sizes, shapes, analyses, finishes and heat-treated conditions in which B&W Mechanical Tubing is available, make it a semi-finished product in itself—reduce all your machining operations to the minimum.

Get the facts on savings from Mr. Tubes, your link to B&W and your local B&W tubing distributor.

*Write for Guide to the Use of Seamless Mechanical Tubing,
Technical Bulletin MMS.*

For more data circle 584 on Reader Service Card



**THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION**

Beaver Falls, Pa. and Milwaukee, Wis.: Seamless Tubing,

Welded Stainless Steel Tubing

Alliance, Ohio: Welded Carbon Steel Tubing

Milwaukee, Wis.: Seamless Welding Fittings

TA-5031 (G)

CUT DRILLING COSTS

Precision
HSS and CARBON
TWIST DRILLS

Midget Twist Drills from
.0059 dia. to $\frac{5}{8}$ " dia.
straight shank



STEP-UP DRILLING PRODUCTION LICK TOUGH DRILLING PROBLEMS THESE 4 PRECISION WAYS

1. MORE HOLES AT LESS COST — Correctly hardened and deep-freeze treated for longer life. Precision drills give consistent, dependable performance.
2. MORE HOLES PER GRIND — Precision drills are made of tough, durable heat-treated steel to exacting specifications that guarantee longer drill life!
3. MORE ACCURATE HOLES — perfectly-pointed Precision drills are ground from solid hardened blanks on Precision self-designed, hand-built machines which combine *points grinding and fluting . . . GUARANTEE* utmost accuracy . . . longer!
4. ECONOMICAL — Precision drills cost less . . . save you money . . . up to 15%!

PROVE IT TO YOURSELF with Precision's
NO-RISK UNCONDITIONAL GUARANTEE . . .

Precision WRITE TODAY for FREE catalog

Twist Drill &
Machine Company

Dept. MMS-3, Woodstock St. —Crystal Lake, Ill.

Representatives — Distributors Some Choice
Territories Still Available

For more data circle 585 on Reader Service Card

314 modern machine shop

ASTE Exposition . . .

"Plas-T-Clad" Abrasive Stones are supported on the sides by the tool body. The use of a high percentage of the full depth of the honing stone is possible with this design, where the side support is stationary and the expansion support moves as the stone is expended. Protective material covers the sides of the stone to prevent galling. With this tool design, the set of expended stones are removed and new stones are inserted in seconds. Various types of drive adapters; stone holders; "Plas-T-Clad" abrasives of the full depth, skirt and clamp types; and a variety of sample parts will be also available for close inspection by visitors.

Other products to be displayed include a representative model of the Barnesdril line of combination magnetic and fabric filters and magnetic coolant separators.

For more data circle 66 on Reader Service Card

★ ★ ★

SPECIAL-PURPOSE TRACER- CONTROLLED MILLING MACHINES

The New England Machine and Tool Co., 913 Farmington, Berlin, Conn., will exhibit two special-purpose tracer-controlled milling machines, which utilize an original non-contacting tracer, in Booth No. 461. The New England machines are sold through the nationwide sales organization of Pratt & Whitney Co., Inc., West Hartford, Conn. The Model 102 Electronic Airfoil Milling Machine produces irregular, three-dimensionally contoured parts, such as jet engine blades, vanes and buckets, by copying a series of representative cross-sectional templates. A unique interpolating system enables the machine not only to duplicate the cross-sectional templates,

LIKE A
"45" AUTOMATIC

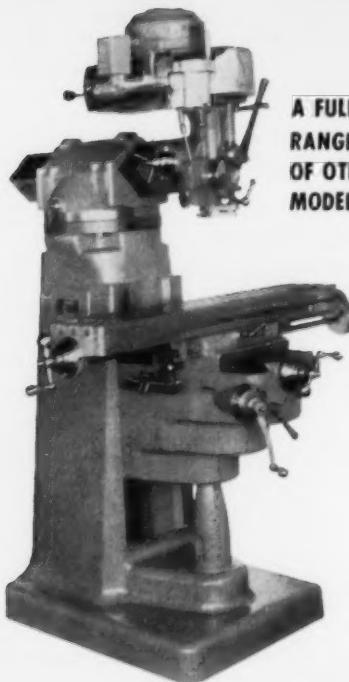
this NEW "45"
INDEX 45 MILL

has the "CALIBER" and "ACCURACY"

to do your

MILLING, DRILLING
and BORING JOBS

BETTER, FASTER AND
MORE ECONOMICALLY!



A FULL
RANGE
OF OTHER
MODELS.

The big caliber derives from the sliding overarm—The unique square design of this overarm gives much more rigidity with its resultant greater accuracy—It provides extra range and capacity—More usable working space—More versatility in set-up—More power at the cutter. No adjustment required on overarm and head after use, and no need to re-indicate head after moving overarm. Speed range with 9 changes makes possible the use of high speed or carbide tipped cutters to the best advantage. Many other important features. Write for Literature.

VISIT OUR BOOTH 791
A. S. T. E. Ind. Exp.

Index Machine Co.

544 N. MECHANIC STREET

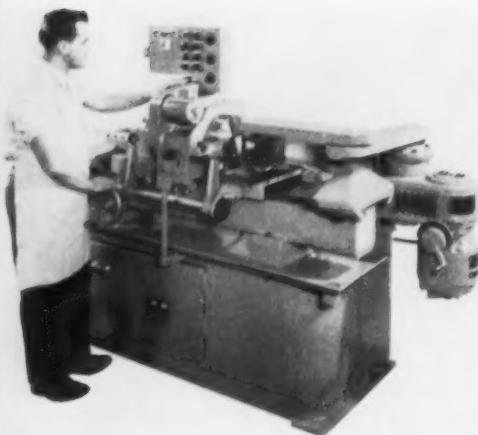
JACKSON, MICHIGAN

For more data circle 586 on Reader Service Card

March, 1956

modern machine shop 315

ASTE Exposition . . .



New England No. 102 Electronic Miller

but also to generate the faired surfaces between and beyond these sections. The machine has proven to be a great time-saver in originating master tooling by eliminating guess-work and many hours of hand filing.

The Model 104 Electronic Template and Cam Machine generates external and internal contours on cams, templates, blanking punches and dies by following an enlarged conductive line drawing. Because of its ability to reproduce contours from an easily prepared drawing with excellent precision,

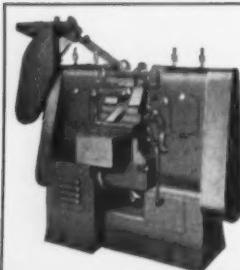
it eliminates much hand work and frees the designer from the limitations of describing contours in terms of simple geometric figures. A wide spindle speed range from 48 to 11,500 r.p.m. permits milling in tough materials with large cutters, fast carbide milling, and also grinding operations. Also demonstrated will be the Model 105 Airfoil Measuring Machine. This machine provides a completely new, direct reading, single-operation method of inspecting airfoil contours on jet engine blades and similar shapes. It measures errors directly from the 10:1 ratio glass (or vinyl) charts, which are used as the basic information, starting with the design through all stages of manufacture, of these irregular and twisted blade contours.

For more data circle 67 on Reader Service Card

★ ★ ★

AIR AND HYDRAULIC OPERATING EQUIPMENT

New, advanced designs in air and hydraulic operating equipment will be shown and demonstrated in Booth No. 245 by Logansport Machine Co., Inc., 801 Center Ave., Logansport, Ind. Included in the display will be new lines of pilot-operated solenoid hydraulic control valves and the recently developed lines of Ultra-matic and Ultra-mation air and hydraulic cylinders. Also on display will be Logan air and



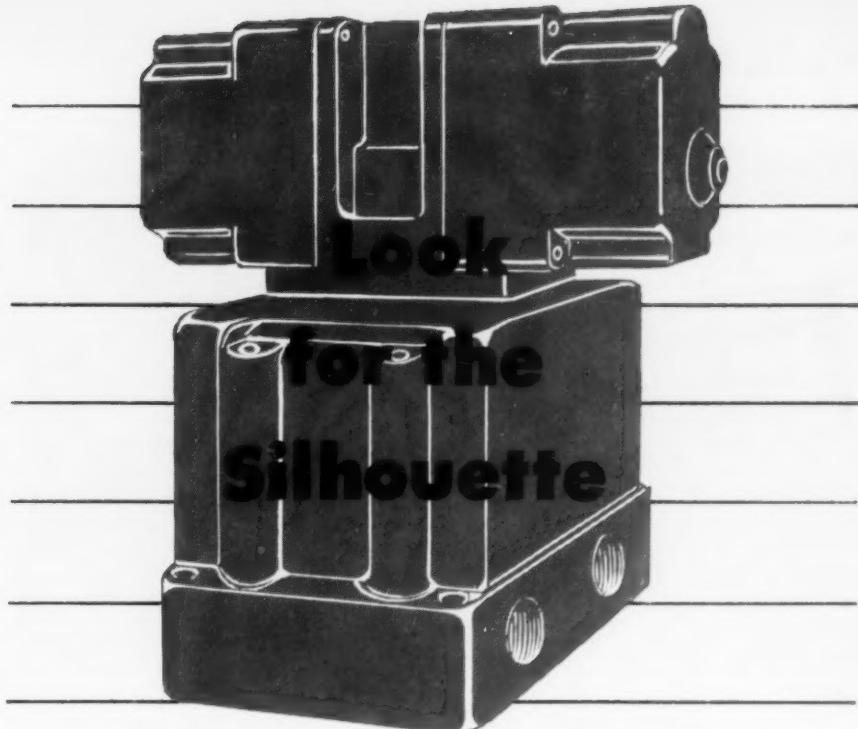
for speedy drilling
OF COTTER PIN HOLES IN SCREWS, BOLTS, ETC.

The KENT Duplex DRILLER

Two drills move toward the center. One drill then withdraws and the other completes the hole. Parts can be drilled and countersunk at the same operation. Semi-automatic or full automatic feed. Write for illustrated descriptive literature.

The KENT MACHINE CO. • Cuyahoga Falls, O.
Drillers - Threaders - Slotters - Countersinkers - Bar Pointers

For more data circle 587 on Reader Service Card



A warm welcome awaits you at Booth No. 328 during the A.S.T.E. Industrial Exposition (Tool Show) at Chicago, March 19 to 23.

Here you will receive advance information about NOPAK-MATIC...a complete new line of solenoid pilot operated, poppet-type valves to be introduced later this year. These valves are designed for a wide range of control applications from the simple operation of an air cylinder to the complex, precision operation of completely automated production machinery.

At the NOPAK Exhibit you will also find the new NOPAK Square Head Cylinders and such established products as standard NOPAK Cylinders in various classes of construction, NOPAK Disc-Type Valves, Reciprotrol Valves and V-Type Slide Valves.

LOOK FOR THE SILHOUETTE

GALLAND-HENNING NOPAK DIVISION

2758 S. 31ST STREET

MILWAUKEE 46, WISCONSIN

NOPAK

**VALVES and CYLINDERS
for AIR and HYDRAULIC SERVICE**

For more data circle 588 on Reader Service Card

*You can easily
remove broken
pipes, studs and
screws that defy
movement . . .*



**WITH REPS PIPE &
STUD EXTRACTORS
MAKES STRONG FOUR POINT
GRIP WITHOUT HAMMERING**

A Specialized Tool
that makes a strong
bite, pulling rather
than reaming.
Hardened steel
—will remove
any material.

Immediate
Positive
Simple



In sizes for every
pipe $\frac{1}{8}$ " to 2",
every stud and
screw $\frac{3}{8}$ " to $3\frac{1}{2}$ ".

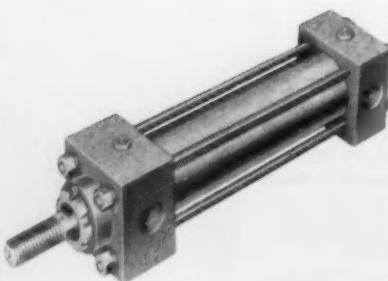
Send for descriptive bul-
letin #10 listing these
and other Walton Spe-
cialized Tools: Tap Ex-
tractors, Tap Extensions
and "Walton-American"
Tool Holders. All tools
offered for a 30 day
FREE TRIAL.

**The WALTON Company
HARTFORD 10, CONN.**

For more data circle 589 on Reader Service Card

318 modern machine shop

ASTE Exposition . . .



View of Logan Ultra-mation Cylinder

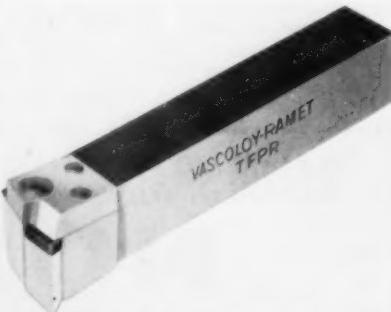
hydraulic valves, hydraulic cylinders, hydraulic power units and power operated chucks. A special feature will be the demonstration of a new automatic machine for turning valve liners. The above and other animated displays will be set up to demonstrate automation at work for industry.

For more data circle 68 on Reader Service Card

★ ★ ★

**MILLING CUTTERS, TOOLHOLDERS
AND TOOLHOLDER INSERTS**

Vascoloy-Ramet Corp., 858 S. Market St., Waukegan, Ill., will display a



V-R Style TFPR Positive Rake Toolholder

March, 1956

Zagar

Gearless Drill Heads

put **4** big advantages to work for you



Any number
of holes



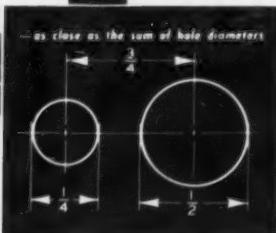
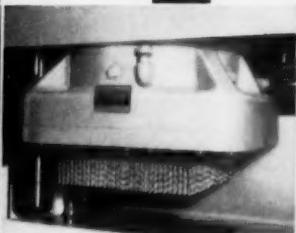
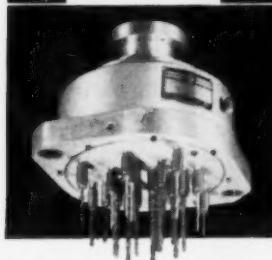
Any hole
pattern



Any material



On all centers



A Zagar drill head is never obsolete. Zagar can re-locate spindles for other hole patterns.

Can you visualize the savings made possible by drilling up to 1000 holes at one pass? Zagar standard practice can handle any machinable material up to 1½" diameter. Holes of varying diameters can be drilled to form any pattern. Zagar Gearless Drill Heads, their efficiency proven by many years' success, can be installed on existing drill presses. Or, Zagar will lay out the necessary tooling for your entire job. May we see your sample parts and study your requirements? There is only one right answer—one best answer—for those requirements. May we supply it?

ZAGAR TOOL, INC. 23898 LAKELAND BLVD., CLEVELAND 23, OHIO

Zagar

TOOLS FOR INDUSTRY and SPECIAL MACHINERY

For more data circle 590 on Reader Service Card

We're at Booth 179,
A. S. T. E. Show.

ASTE Exposition . . .

complete line of V-R cemented carbides, "Tantung" cast alloy, toolholders and toolholder inserts in Booth No. 1137. As a part of the show theme "Tooling for Tomorrow," the company will exhibit, for the first time, a new

line of face mill cutters designed around the V-R elevator toolholder principle. The new milling cutters feature the use of "throw-away" carbide inserts which eliminate grinding. When the cutter is dull, all inserts are indexed to new cutting edges in a matter of a minute or two without the necessity of gaging each tooth to assure uniformity of the cutting edges. When the cutting edges are used up, the inserts are thrown away without regrinding, and a complete new set can be installed quickly and easily without any gaging necessary. The milling cutters will soon be available in 4, 6, 8 and 10-inch diameters.

Three new styles of 6-degree positive rake toolholders will also be shown for the first time. Style T F P R and TFPL is a new facing tool for use where positive rake machining is necessary for optimum results. This new style employs the use of a triangular insert. Style S B P R and SBPL is for 6-degree positive

IT'S COSTING YOU MONEY, Not to have . . . **MOTO-TOOLS** in your shop!

Dremel Moto-tools pay for themselves OVER and OVER in your tool room and on your production line. High speed precision tools. Real time savers for polishing, grinding, sharpening and de-burring operations.

Weighs only 13 oz., develops 27,000 R.P.M.

Moto-Tool No. 2 with one emery wheel point \$17.85

Moto-Tool Kit No. 2 with 23 assorted accessories including high-speed steel cutters and Model 2 Moto-Tool in sturdy steel case \$25.95

INDUSTRY'S PORTABLE MACHINE SHOP FROM TOOL ROOM TO PRODUCTION LINE



It's light-weight—easy to handle. Ideal for women operators on de-burring work. Female assembly line workers use Moto-Tool all day long without tiring.

See your industrial distributor or write for Dremel Catalog.

DREMEL MANUFACTURING CO., Dept. 226-C, Racine, Wisconsin

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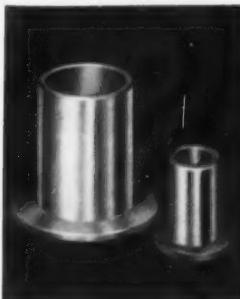
THIS *new* BEARING SERVICE HELPS YOU IN MANY WAYS

The development of a complete standardized line of stock Sintered Bronze Bearings and Bars by Bunting opens the door to many economies and advantages in production and maintenance of machinery and mechanical components.

Here is a far more complete range of standard sizes than has heretofore been available in this material. Bunting's powdered bronze stock line is the first to include all ASTM standard sizes to ASTM recommended dimensions and tolerances in both plain and flanged bearings and thrust bearings.

Together with the long established Bunting stock line of Cast Bronze Bearings and Bars, these new sintered bronze Bunting products bring to mechanical industry ready-to-use bearings that will squarely meet your blue print and cost requirements.

Both Bunting Cast Bronze and Bunting oil filled, self-lubricating sintered powdered Bronze Bearings and Bars are available to you through your nearest Bunting Distributor. He has in stock all sizes for your immediate needs. Ask him or write for complete lists and dimensional data on Bunting Cast Bronze and Bunting Sintered Bronze Bearings.



Bunting®

BUSHINGS, BEARINGS, BARS AND SPECIAL PARTS
OF CAST BRONZE AND POWDERED METAL

The Bunting Brass and Bronze Company, Toledo 1, Ohio
Branches in Principal Cities • Distributors Everywhere

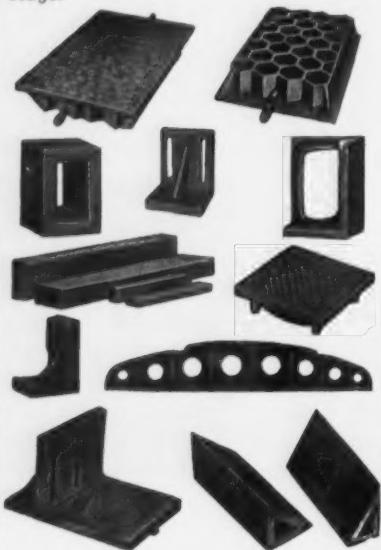
For more data circle 592 on Reader Service Card

modern machine shop 321

ASTE Exposition . . .

BE SURE!

And you can be sure of accuracy when you use ACME TOOLS in the Shop, Tool Room or Inspection Departments for checking Flats, Angles, or Heights. Made of MEEHANITE METAL, these tools are designed to maintain their rigid precision and give long service even with hard usage.



Surface Plates — Box Parallels
Slotted Angle Plates
Universal Right Angles
Flat Parallels — Lapping Plates
Toolmakers' Knees — "V" Blocks
Straight Edges (Bridge Type)
Straight Edges (Leveling Type)
Measuring Irons
Masterangle Plates
Angle Attachments
Send for Bulletin

ACME TOOL CO.

73 W. Broadway New York 7, N. Y.

For more data circle 593 on Reader Service Card

322 modern machine shop

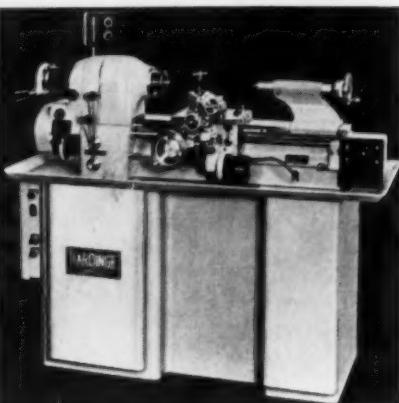
rake turning with a 15-degree lead angle using a square "throw-away" insert. Style SFPR and SFPL employs the use of a square insert for 6-degree positive rake facing with a 15-degree lead angle. All three styles will soon be available in the most popular shank sizes.

Also displayed will be a new ceramic-type cutting material for use in toolholders. This new material, while at present limited in its application, shows great promise in machining at ultra-high speeds and light feeds on finishing operations. Possible use on a wider scope is indicated in tests now in progress, and limited distribution of the product is expected in the future. For more data circle 69 on Reader Service Card

★ ★ ★

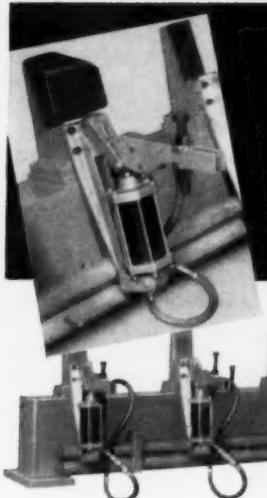
LATHES, MILLERS, CHUCKING MACHINES AND SECOND OPERATION MACHINES

The newly complete line of toolroom and production engineered Hardinge

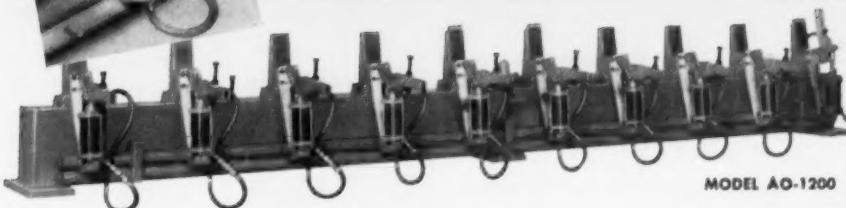


Hardinge Model HLV Lathe with independent variable spindle speed and feed control

March, 1956



LAPEER
AIR CLAMPS
Set the Pace
in ARC WELDING



MODEL AO-1200

Faster production and improved quality in the automatic arc welding of trailer frame seams will be achieved by this new fixture at PAMCO COMPANY, Frazer, Michigan, through the use of Lapeer Air Clamps.

Pictured above is the Pamco holding fixture which features a battery of 10 Lapeer AO-1200 Air Clamps in place of the time-consuming C-Clamps formerly used.

This is another example of Lapeer's know-how—its ability to help industry cut time and slash costs. If you have a work holding problem, Lapeer-designed clamps can help you do a better job—at lower cost. Write today for complete information.

See all of these
at our BOOTH #553,
A.S.T.E. SHOW
at Chicago
in March.

SEND FOR OUR CATALOG NOW!

Manufacturers of a complete line of Stationary and Portable Clamps and Pliers

**KNU-VISE
PRODUCTS**

LAPEER MANUFACTURING CO.

3048 DAVISON ROAD

WESTERN DIVISION: 422 Magnolia, Glendale, California • CANADIAN DIVISION: Higginson Engr., Hamilton, Ontario

For more data circle 594 on Reader Service Card

LAPEER, MICHIGAN

ASTE Exposition . . .

lathes, millers, chucking machines and second operation machines will be exhibited in Booth No. 452 by Hardinge Brothers, Inc., Elmira, N. Y. On exhibit for the first time together will be the revolutionary Hardinge push-button spindle speed controls on all Hardinge precision lathes, including the Model HLV, high speed toolroom

lathe; Model DV59 high speed precision lathes; Model TFB high speed precision turning, facing and boring machine; and Model DSM59 high speed precision second operation machine. Two buttons on the control box, located conveniently over the headstock, give immediate "slower" or "faster" speed changes anywhere within the range of the machine. Operators save time by avoiding stopping the machine and changing gears, plus increasing production efficiency by the use of the correct cutting speeds for particular cutting tools and materials.

Also on exhibit will be new improved models of the Model HC and HCT precision chucking machines with independent electrical variable speed carriage feed and automatic three-selector variable speed drive. The Model UM universal spiral milling machine will also be shown. All machines will be under power for demonstrations of operating ease, accuracy, and cost cutting ability.

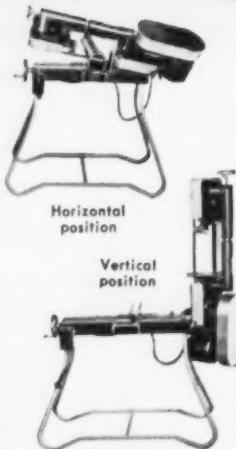
A special section of the exhibit will be devoted to precision collets and feed fingers for all types of automatic screw machines, turret lathes and chuck-

**NOW → YOU CAN HANDLE
METAL CUT-OFF or
LIGHT CONTOUR CUTTING**
*... with one
economically
priced saw ...*

Here's unmatched versatility in a quality built, dual-purpose band saw — the Wells 49-A. **TWO** saws for the price of **ONE**!

Use it as an efficient, money-saving horizontal cut-off saw to handle jobs up to 3½" x 6". Then, with one easy motion, convert it to a vertical band saw. Just swing head into upright position — it's ready to use. No tools required! It's handy for cutting angles and slots, and for light contour work.

The Wells 49-A is a real time and money saver in any shop or experimental lab. Write for full details or call your local Wells Distributor.



See us at Booth 274

at the Tool Show

The Pioneers of Horizontal

**METAL CUTTING
BAND SAWS**

WELLS MANUFACTURING CORPORATION
808 TYLER STREET · THREE RIVERS, MICH.

Wells

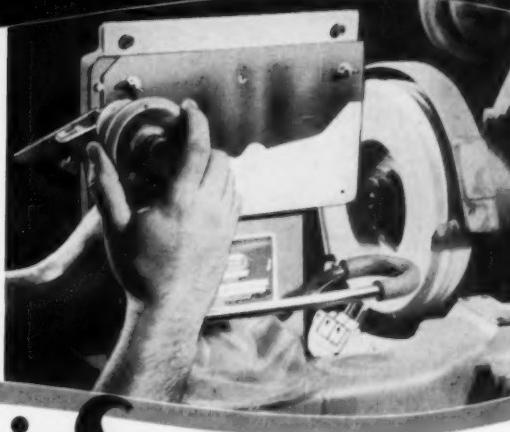
For more data circle 595 on Reader Service Card

FORM-TRUE GRINDING WHEELS

TO
"TENTHS"
ACCURACY
IN
MINUTES
WITH



diaform
WHEEL FORMING ATTACHMENTS



True complex grinding wheel shapes in minutes . . . re-true the same shapes as often as required . . . produce better dies, punches, forming tools, etc. in hours instead of days. Operation, based on pantograph principle, is very simple, makes use of inexpensive, easily prepared templates. Reduction ratios of 10:1 or 5:1 minimize template errors, insure "tenths" accuracy on the grinding wheel.

THE RIGHT SIZE FOR YOUR WORK . . . Diaform Model AT (trues wheels up to 10" dia — 1" wide), Diaform Model 2 (trues wheels up to 14" dia — 2" wide), Diaform Model 4 (trues wheels up to 20" dia — 3" wide).

FOR RELIEF GRINDING . . . the new Series "R" Diaform Attachment eliminates lengthy calculations . . . accurately compensates for rake and relief angles on cutting tools and provides true form at the cutting edge.

PLEASE SEND ME COMPLETE INFORMATION ON:

MODEL AT Diaforms

MODEL 2 Diaforms

MODEL 4 Diaforms

SERIES "R" Diaforms

**SEE THE DIAFORM
AT BOOTH NO. 520,
A.S.T.E. SHOW**

PRATT & WHITNEY COMPANY
INCORPORATED

25 Charter Oak Blvd., West Hartford 1, Conn.

NAME _____

POSITION _____

COMPANY _____

CO. ADDRESS _____

CITY _____ ZONE _____ STATE _____

For more data circle 596 on Reader Service Card

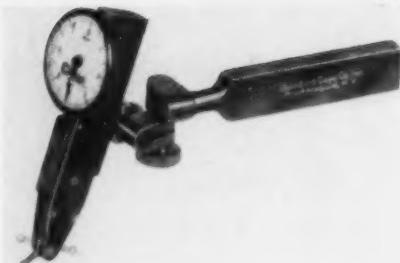
ASTE Exposition . . .

ing machines. Collets for all makes of lathes, millers and grinders will also be featured, along with the famous Hardinge-Sjogren Speed Collet Chucks, Hardinge Collet Index Fixtures and machine tool accessories. For more data circle 70 on Reader Service Card

★ ★ ★

TEST INDICATOR, SETTING MASTER AND LEAD CHECKER

Standard Gage Co., Inc., 84 Parker Ave., Poughkeepsie, N. Y., will display several innovations, including a test indicator, dial bore gage setting master, and lead measuring gage for threads, in Booth No. 1016. The test indicator, designated as the "Checkmaster," includes a number of important features. The instrument is self-reversing; that



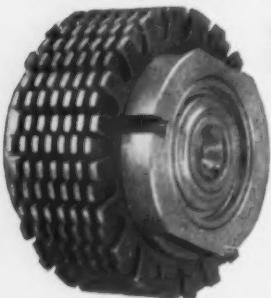
Standard "Checkmaster" Test Indicator

is, the dial hand moves always clockwise regardless of which direction the ball contact is moved. Moreover, no operation of any switching lever is necessary to accomplish this. Contact pressure is light and is uniform for either direction of contact movement. Even lighter pressure than the normal 15 grams is specially available. The indicator of the Checkmaster is said to

HANCHETT METCALF WHEEL DRESSERS

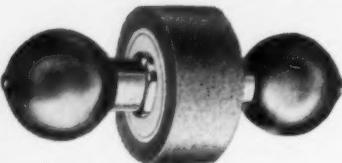
FAST CUTTING ACTION

Balanced . . . Free Running . . . High Speed
Crushing and Wheel Forming Action . . .
For SHARP, CLEAN, OPEN WHEEL FACES



MODEL 1943 CC
ASSEMBLY

STEEL CUTTERS
For Surface
Grinders, etc.



Complete
Extra Wheel \$1.35
Assembly \$7.50

Made by the World's Largest Manufacturers of

SAW SHARPENING and KNIFE GRINDING MACHINERY

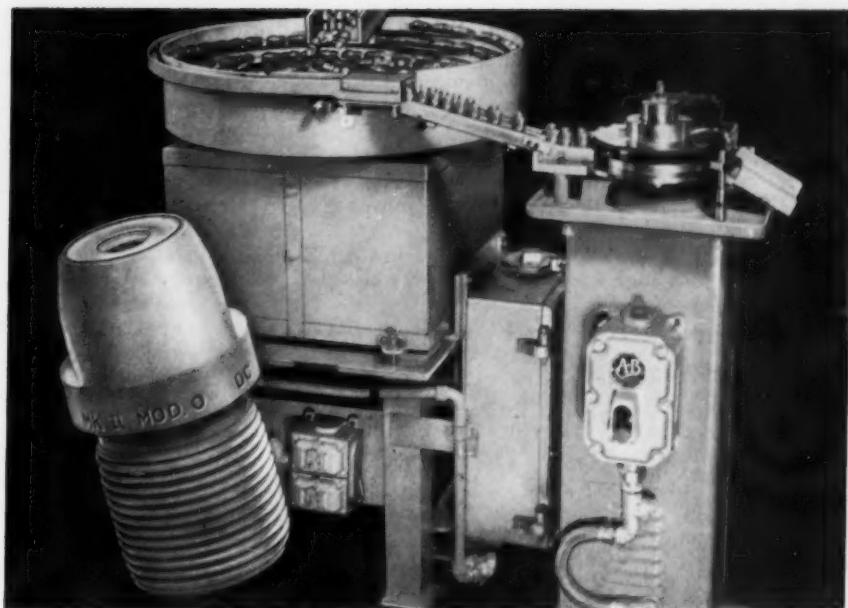
HANCHETT MANUFACTURING CO.

BIG RAPIDS, MICH.

MM-112

PORLAND 1, ORE.

For more data circle 597 on Reader Service Card



Model 435—Speed-marks up to 7500 parts per hour.

AUTOMATION IN METAL MARKING

Here it is . . . the new NOBLEWEST hopper and dial-feed Roll-Marking Machine. With its fully automatic features, it is ideal for integrated line production. With a vibratory feeder, parts are fed to the machine, then permanently marked and automatically ejected. Can be used for speed-marking solid round, heavy walled, or conical parts. Like all Noblewest Roll-Marking equipment, it produces permanent deep impressions . . . good for the life of your product . . . faster, better and at lower cost. For detailed information on this machine or any marking problem write Noble & Westbrook Mfg. Co., 25 Westbrook St., East Hartford 8, Conn.

SEE THE NOBLEWEST MARK-O-RAMA AT THE TOOL ENGINEERS SHOW.

Visit Booth 767 for The Latest Developments in Modern Metal Marking Equipment.

NOBLEWEST
50th ANNIVERSARY

MARK IT BEST WITH

NOBLEWEST

For more data circle 598 on Reader Service Card

ASTE Exposition . . .

be highly sensitive, responding to minute dimensional differences. One of the two models available reads in 0.001-inch increments. The other type, while it is graduated in 0.0001-inch units and can be so used, may be changed to read in 0.001-inch increments simply by the change of a contact point. Ranges are 0.008 inch for readings in

0.0001 inch and 0.016 inch for readings in 0.001 inch.

The adjustable setting master for dial bore gages is offered as a device for substituting this one gage for a number of fixed ring master gages which would otherwise be required. The adjustable anvil of the master is set by means of gage blocks to the desired dimension away from the fixed anvil and thus can be changed from time to time as occasion may require. A feature of this master is the rotating device which allows the weight of the blocks to come only on the fixed anvil while the setting is being made, but which takes the weight of the gage off the movable plunger of the bore gage while it is being set in the master. Proper pressure when setting the master to gage blocks is said to be assured by a ratchet stop, similar to the type used on a micrometer. An easily removable guide cap, which limits the lateral motion of the fixed contact of the bore gage while being set, greatly facilitates both initial setting and subsequent reference.

New elements will be shown for the Versa-Dial gage, a basic dial

Is this YOU?

asg

UNIVERSAL JOINTS

immediately available
from distributors' stock

Have you ever been behind the 8 ball when a universal joint breaks? You can get immediate delivery on 13 sizes of A.S.G. Universal Joints with bored or solid hubs ranging in diameter from .375" to 4.000".

All A.S.G. Universal Joints are provided with self-locking retaining rings on the small pin. No rivet pins are used.

Write today for your free copy of Bulletin No. 527 listing the complete line of A.S.G. Universal Joints.

AMERICAN STOCK GEAR DIV.
The Perfection Gear Co.

Harvey, Ill.,
U.S.A.

For more data circle 599 on Reader Service Card

GET MOST FROM YOUR GRINDING DOLLARS

with **UNITED STATES
ELECTRICAL
GRINDERS**

GREATER PRODUCTION...
TOP QUALITY RESULTS...
LOWEST COST PER PIECE...

all these and more are assured each and every time. Thousands of grinders now on the job prove their superiority. Put them to work for you, too, in YOUR plant.

WRITE FOR COMPLETE CATALOG

on your firm letterhead, please

BUFFERS
Bench
Floor

GRINDERS
Angle Plate
Bench
Brake Drum
Disc,
floor type
Floor
Portable
Precision
Swing Frame
Tool Post
Vertical Spindle
Wet

DRILLS
Portable electric

DUST
COLLECTORS

HEAT GUNS

DRILL STANDS
Bench
Post Bracket

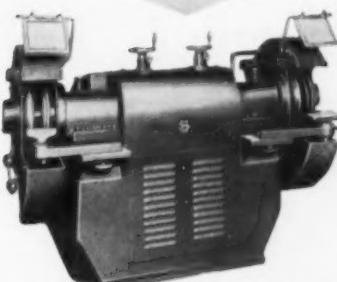
NUT SETTERS
PILOTS
POLISHERS
Portable
Bench
Floor

SANDERS
Disc, portable
HOLE SAWS

SCREW DRIVERS

VALVE SEAT
GRINDERS

and other items



DUAL MOTOR VARI-SPEED SNAGGING

GRINDER Model 62VS

For vitrified or high speed wheels. Each wheel operates independently. Built to maintain constant wheel periphery and to compensate for wheel wear.



UTILITY FLOOR GRINDER Model 500

Totally enclosed motor, 1 to 5 hp. Push button starting with overload protection. Ball bearings enclosed in dust-tight housings. Enclosed adjustable wheel guards. Tool tray and lift-out water pot. Ball-bearing.

THE UNITED STATES ELECTRICAL TOOL COMPANY
3646 Llewellyn Street, Cincinnati 23, Ohio

For more data circle 600 on Reader Service Card

ASTE Exposition . . .

unit which, when fitted with the proper attachments, will check gears, counterbores, grooves and the over-all assembling characteristics of threads. These new elements, however, provide for the measurement of lead. With one basic instrument, threads can be checked for over-all assembling characteristics with the external or internal segments an-

nounced previously; or, with these latter developments, the lead may be measured as a separator factor.

For more data circle 71 on Reader Service Card

★ ★ ★

TAPPING AND DRILLING ATTACHMENTS

Commander Mfg. Co., 4224 W. Kinzie St., Chicago, Ill., will be demonstrating its complete line of production tools in Booth No. 800. Each product will be powered for actual demonstrations. The two newest products—the "Multi-Tapper" and the air-actuated Pneu-Matic Tapper—will be of special interest. The "Multi-Tapper" is a universally-adjustable multiple-spindle tapping attachment, for use on any drill press, which permits up to eight holes to be tapped at one



The lapped finish on the hard knurling surface of the knurl contributes to outstanding performance and longer life.

Over 100 styles and sizes in stock.
Special knurls to your specifications.

REED ROLLED THREAD DIE CO.

Thread Rolling Machines and Dies, Thread Rolling Attachments,
Thread Rolls and Knurls for Automatic Screw Machines and Turret Lathes
WORCESTER, MASSACHUSETTS, U. S. A.

For more data circle 601 on Reader Service Card

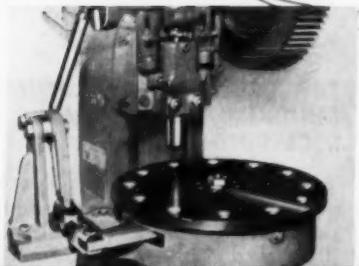


Commander "Multi-Tapper" Tapping Unit

*How to
CUT
Labor Costs!*

Automate YOUR PRESENT **benchmasters** AND OTHER PRESSES!

With these additional Benchmaster products
you can easily convert your present production lines
to full or semi-automation at minimum cost!

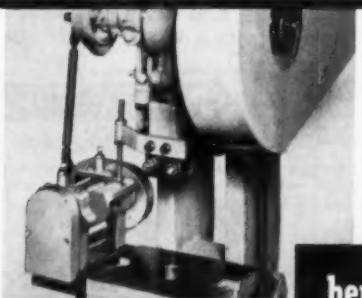
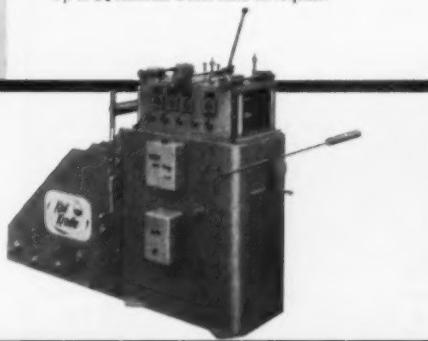


benchmaster KOIL KRADLE-STRAIGHTENER COMBINATIONS (Available singly or in combination)

Automatically feeds and straightens coil stock—even in foil thicknesses supplying *any* machine from a slack loop. Equipped with variable speed drive. Quick disengage lever releases top rollers... instantly shuts off entire unit. Many width and thickness capacities. Ask for recommendations.

benchmaster AUTOMATIC DIAL INDEX FEEDS

Converts punch presses or drill presses to high speed automatic operation. Avoids expensive investment in single-application machines. Excellent for marking, assembling, reaming, trimming, crimping, etc. Up to 6000 strokes per hour! Easy 4 bolt mounting. 12", 15" table diameters. Up to 24 stations. Other sizes on request.



benchmaster AUTOMATIC FRICTION ROLL FEEDS

The one roll feed that can't be beat for performance at low cost. Feeds cloth, cork, paper, metal, etc. Fits new or old Benchmasters and other presses. Height adjustment levels rollers with die. Roll lifters automatically release grip after each stroke for accurate positioning. Ground, knurled or rubber covered rolls in 3, 5, 7 and 9" widths. Strokes: 0 to 3" cut-off and 0 to 6" cut-off.

benchmaster

World's largest
manufacturer of small punch
presses and mills.

1835 W. Rosecrans Avenue, Gardena, California

For more data circle 602 on Reader Service Card

ASTE Exposition . . .

stroke. A unique pitch compensating feature for the unit's spindles permits simultaneous tapping with taps of different pitch.

The Pneu-Matic Taper is a high speed tapping unit that is designed for production, general purpose or extreme precision tapping. Pneumatically

actuated, with precisely adjustable rate of spindle approach and tapping depth control, the attachment makes any drill press a high speed production tapping unit. When desired, the Pneu-Matic Tapper may be converted to a lead screw taper in a few minutes.

Other production tools to be shown include the "Multi-Drill," "Select-A-Spindle," "Lead-Matic" Tapper, "Multi-Angle" Drill Unit, Commander tapper and the Commander drill chip breaker.

For more data circle 72 on Reader Service Card

★ ★ ★

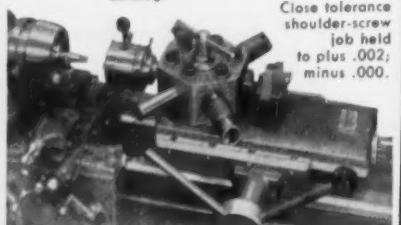
TAP DRIVERS, NUT RUNNERS, CHUCKING TOOLS AND RECESSING TOOLS

Nine new products will be exhibited in Booth No. 488 by Scully-Jones and Co., 1909 S. Rockwell St., Chicago 8, Ill. New and improved "Safe-Torque" Tap Drivers, of the non-reversing and reversing types, will be demonstrated in drill presses, tapping blind holes in aluminum and steel. "Safe-Torque" Nut Runners will be set up in air power tools to show the speed and consistency of tightening nuts to a specified torque. A setup consisting of "Roll-Lock" and "Better-Hold" Chucking Tools and "Pin" Arbors will show the accuracy, high holding power and ease of chucking parts and tools. A slow motion demonstration to show the operation

- Double Drive Gears
- Double Rocks
- Assures Equalized Power

- Mfrs. most complete line of Lathe Turrets. Send for latest catalog.

Close tolerance shoulder-screw job held to plus .002; minus .000.



ENCO Manufacturing Co., Dept. 136
4524 W. Fullerton Ave., Chicago 39, Ill.

For more data circle 603 on Reader Service Card

Our large, planned stocks of

Punches & Dies

mean savings for you.

For years we have been following a systematic plan of increasing our stocks of standard punches and dies that benefits you two ways:

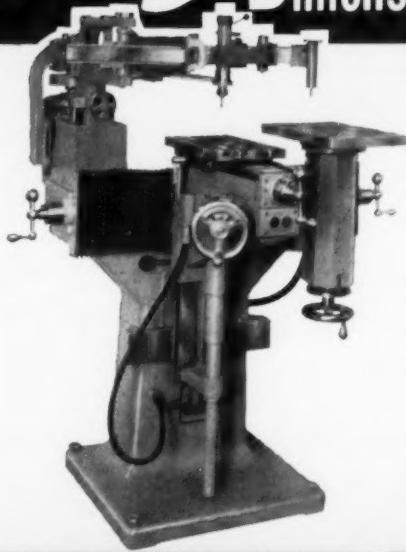
- (1) The punches and dies you need are ready and waiting for you when you need them.
- (2) Because standards are made in large quantities, prices are surprisingly low—quality of the highest. 68 years of experience goes into every Lewthwaite tool—and it shows! Catalog Sheets On Request.

• 317 East 47th St. • New York 17, N. Y.

T. H. LEWTHWAITE MACHINE CO.

For more data circle 604 on Reader Service Card

3-Dimensional panto-miller



For accurate pantograph milling on all 3-dimensional work, the "Panto-Miller" 3A is a sturdy production machine. Accurately reproduces copy on flat or curved surfaces, in reduced or magnified size.

NEW:

- Capacity** for workpiece height.
- Sensitivity** of linkage.
- Range** of pantograph ratios.
- Accuracy** of reproduction.
- Finger-Tip Control** of spindle speeds.
- Ease** of operation.

The new Panto-Miller 3A is an economical answer to many standard and special production problems. Write for Bulletin PM3, which gives details and specifications.

2-Dimensional panto-miller



Versatile and dependable for continuous service, the J & B "Panto-Miller" 2A:

- Engraves**
- Profiles**
- Die Cuts**
- Mills**

Investigate its advantages for your own applications. Send for Bulletin PM2

3-WAY Indexing Trunnion

Simple, Rapid, Positive positioning of workpiece or jig for all angle Drilling, Tapping, or Counter-boring. Available with Chuck, Faceplate, or Right-Angle Adaptor Plate. Complete with Station Selector. For details, ask for Bulletin IT3.



WITH
RIGHT ANGLE ADAPTOR



WITH
FACE PLATE



EST 1870

JOHNSON & BASSETT, INC.

PRODUCTION TOOL DIVISION
WORCESTER, MASSACHUSETTS

For more data circle 605 on Reader Service Card

ASTE Exposition . . .

and construction of recessing tools for high production grooving operations will also be shown.

The "Scully-Drift" will be demonstrated by hand to show the ease and speed of ejecting taper shank tools without damage to the spindle, bearings and cutting tools. A "Toolitrol"



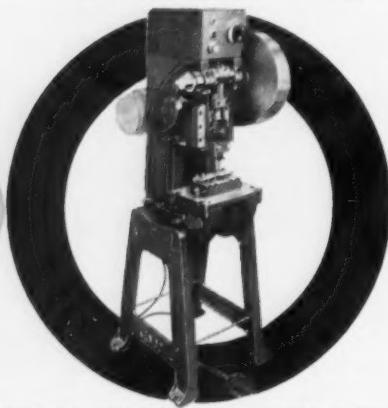
Scully-Jones New Lock and Eject Adapter

Board and presetting tools will show how at-the-machine problems of pre-setting, storing and changing tools in multiple spindles are coordinated to reduce set-up time, down time and inspection time and keep machines running at near capacity.

A quick-change spindle attachment will be demonstrated to show how tool changes in adapter-type spindles can be speeded up to minimize down time and speed production. "Lock-and-Eject" Collet or Chuck-Type Tools will show high holding power of the new "Lock-and-Eject" quick-change feature. New light gages for quick, accurate inspection of tapers will also be shown.

Other products to be displayed include tap and drill chucks; mill-

**KENCO 15-ton
ELECTRO-SAFE
— the safest
punch press
you can buy!**



Single-trip control buttons are widely spaced, to keep hands clear of the danger zone. Operator must push both buttons at once...hold them until stroke reaches bottom, then release both buttons to start new cycle. Fail-safe operation. Impossible to "fudge." Impossible for press to double trip.

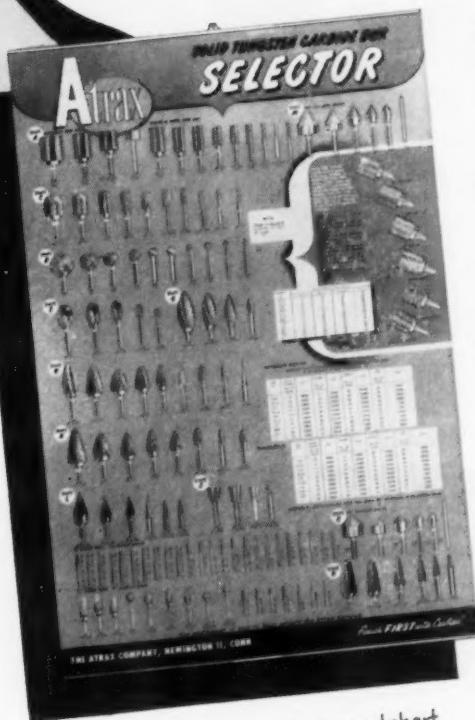
VERSATILE CONTROLS — You can change from "single trip" to "continuous stroke," or "inching" by merely turning a dial. You can change timing in seconds. No flywheel...no clutching. Write for details.

KENCO MANUFACTURING CO.
Mfrs. of Precision Machinery and Accessories

5211 Telegraph Road, Los Angeles 22, California
SEE OUR DISPLAY — BOOTH 618 — A.S.T.E. SHOW

For more data circle 606 on Reader Service Card

**SEND FOR THIS
FREE ATRAX SOLID CARBIDE
BUR SELECTOR CHART**



Today!

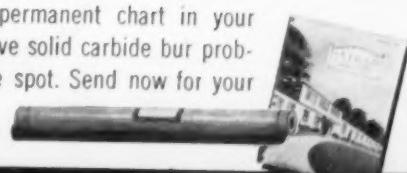
127 solid carbide burs
shown full size!

Packed with tips
for better
bur performance!

Shows cuts
available:
STANDARD-
FINE-COARSE-
EXTRA COARSE-
DIAMOND-
CHIP BREAKER!

All the information for
ordering the right solid
carbide bur for any job!

Mailed in rigid tube
... and it's FREE!



A
Attrax

THE ATRAX COMPANY
Newington 11, Conn.

For more data circle 607 on Reader Service Card

March, 1956

modern machine shop 335

ASTE Exposition . . .

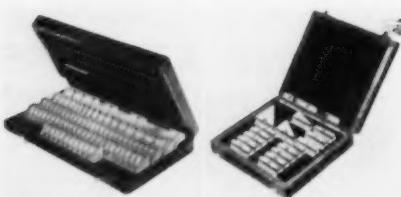
ing machine arbors and adapters; quick-change chucks; tap holders and drivers; counterbores, countersinks and core drills; adjustable adapters and spindle extension assemblies; sleeves and sockets; "JA," "JS," and "JT" types of floating holders with the double gear spline for unrestricted float and long life; centers; and Flowmeters for liquid air and gas.

For more data circle 73 on Reader Service Card

★ ★ ★

GAGE BLOCKS, HEIGHT GAGE AND SURFACE INTERFEROMETER

In Booth No. 936, Webber Gage Co., 12899 Triskett Rd., Cleveland 11, Ohio, will exhibit its linear and angle "Laboratory Master" Gage Block Sets; the "Thin Block" Gage Set; the "Heavy



Webber "Laboratory Master" Linear (left) and Angle (right) Gage Block Sets

Duty" Gage Block Set; a height gage; and the Davidson Surface Interferometer. In the two "Laboratory Master" Gage Block Sets, the linear blocks are certified accurate to plus or minus 0.000001 inch, and the angle blocks are accurate to $\frac{1}{4}$ second. These unusually accurate blocks are not intended for use as working blocks; instead, they enable the precision manufacturer to have his own gaging laboratory for checking his working blocks against this master set. The linear gage blocks

EASY MATH. AT YOUR FINGERTIPS

USING THESE EQUATION CHARTS YOU CAN CALCULATE IN HIGHER MATHEMATICS. NO PREVIOUS TRAINING NECESSARY.

Thousands of these charts used by draftsmen, tool, die and jig makers, machinists, students, inspectors, template makers and designers. Each chart has instructions to SHOW YOU HOW TO DO IT. Send today for these valuable charts. No stamps. No C.O.D. under \$1.00.

MONEY BACK GUARANTEE.

Send for Circular on
New Manual for
MECHANICS'
CALCULATION



TRIG-EASY chart for plane angles and dimensions (As Shown) Postpaid 50 cents

TRIG-EASY chart for spherical angles and dimensions Postpaid 75 cents

TRIG-EASY chart with pocket manual over 140 pages, 60 drawings, 6 decimal trig. function table for compound angles and dimensions in machine set up, etc.

Postpaid \$1.75

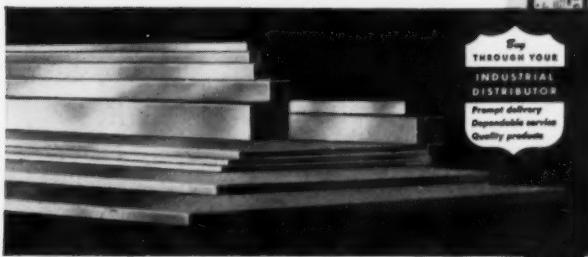
TRIG-EASY complete set, 3 charts and instructions listed above Postpaid \$3.00

CURVE-EASY set 2 charts with pocket manual of over 60 pages, 50 drawings for section areas and volumes of a circle, sphere, ellipse and parabola; cylinders, cone and frustum Postpaid \$2.50

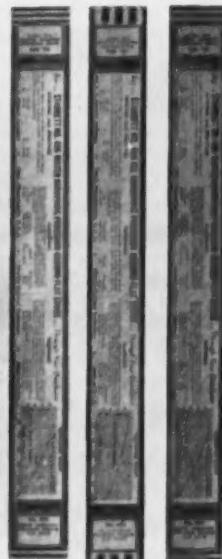
EARL H. NEEDHAM
CULVER CITY, CALIF., U. S. A.
P. O. BOX 587, DEPT. N.
SOLD BY EUGENE DIETZGEN CO.

For more data circle 608 on Reader Service Card

NOW OVER
1000
 SIZES



Buy
THROUGH YOUR
INDUSTRIAL
DISTRIBUTOR
Prompt delivery
Dependable service
Quality products



Starrett
 precision ground
FLAT STOCK
 and **DIE STOCK**

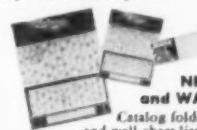
Now it's easier than ever to save time and money by using Starrett Precision Ground Die Stock and Flat Stock. With over 1000 sizes available, you can make *all* your machine and fixture parts, special tools and gages, stamps, dies, cutters, templates this sensible, money-saving way.

Just think what it means . . . no time lost hunting up stock — no slow and costly grinding to size. Just lay it out and saw it out. Four types — air, oil, oil or water and water hardening — let you choose the hardening characteristics that fit your specific needs. Your Industrial Distributor has it. Specify *Starrett* to get the wide choice of sizes.

FOUR HARDENING TYPES

- No. 497 Air Hardening (Non Deforming)
- No. 498 Oil Hardening (Non Deforming)
- No. 495 Oil or Water Hardening
- No. 495 Water Hardening

Flat Stock comes in 18" lengths, Die Stock in 36" lengths. Thicknesses from $\frac{1}{16}$ " to 3". Widths from $\frac{1}{2}$ " to 14". Each piece marked for type and size and individually packaged in protective envelope.



**NEW FOLDER
and WALL CHARTS**

Catalog folder, desk chart and wall chart list all types and sizes with hardening formulas. Write for free copy. Address Dept. MD

Starrett
 "WORLD'S GREATEST TOOLMAKERS"

MECHANICS' HAND MEASURING
TOOLS AND PRECISION INSTRUMENTS • DIAL INDICATORS • STEEL TAPES
PRECISION GROUND FLAT STOCK • HACKSAWS, BAND SAWS and BAND KNIVES
THE L. S. STARRETT COMPANY, ATHOL, MASSACHUSETTS, U. S. A.



VISIT THE STARRETT EXHIBIT — BOOTH 1116 — ASTE SHOW

For more data circle 609 on Reader Service Card

March, 1956

modern machine shop 337

ASTE Exposition . . .

are made of solid chrome carbide, a material which is unusually hard and extremely resistant to corrosion. They are individually calibrated for accuracy by the Zeiss Interferometer, which uses the wavelength of light as its standard of measurement.

The "Thin Block" Gage Set is designed for precision manufacturers who

work to measurements under 0.100 inch. Made of steel, these blocks range in thickness from 0.090 to 0.010 inch and are designed for daily production requirements.

The all-purpose "Heavy Duty" Gage Block Set contains 84 blocks and all accessories needed for a complete gaging system. This set will assemble into any desired length and into dividers, scribes, height gages or snap gages. It is available in accuracies of

PRICE LIST

ON HANNIFIN STOCK HYDRAULIC PRESSES

| | |
|---------------------|----------------|
| 1-TON | \$ 552 |
| 2-TON | \$ 627 |
| 5-TON | \$1,286 |
| 8-TON | \$1,581 |
| 10-TON | \$1,855 |
| 25-TON | \$3,681 |

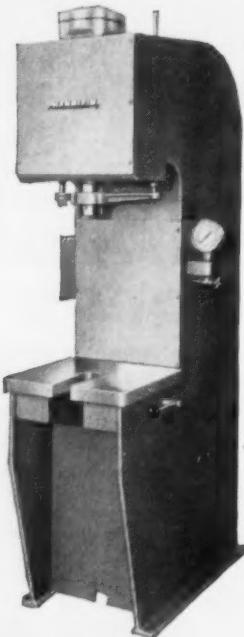
Prices complete with motors and starters F.O.B. our press plant, St. Marys, Ohio, subject to change without notice.

DELIVERY FROM STOCK

Demand for these popular presses is so consistent we are able to produce them in quantity and pass the savings along to you.

Construction-wise and quality-wise these small general-purpose presses are identical to the larger Hannifin presses, up to 150 tons. Special, optional controls when needed.

WRITE for complete information on the Hannifin Hydraulic Press you're interested in.

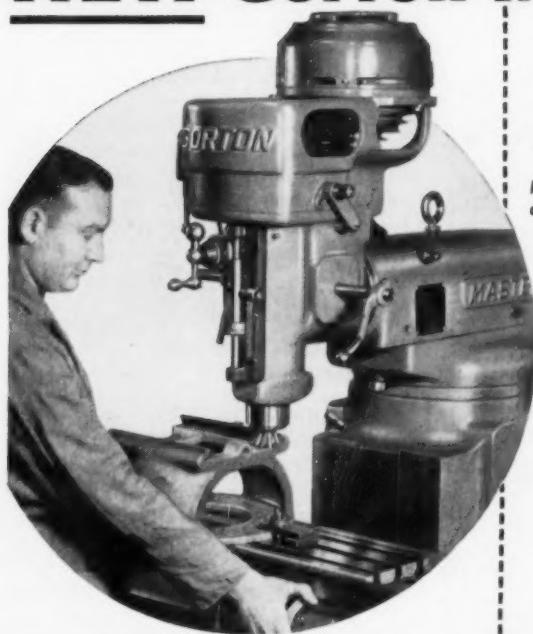


HANNIFIN

HANNIFIN CORPORATION, 565 S. WOLF ROAD, DES PLAINES, ILLINOIS

For more data circle 610 on Reader Service Card

NEW Gorton Mastermill



\$2750
(WITH ELECTRICS)

Never before a machine like this at a dollar a pound!

- PRECISION SPINDLE; 10 SPEEDS, 80-5600 R.P.M. STANDARD
- DESIGNED AND BUILT TO PROVIDE SUSTAINED ACCURACY
- LONGITUDINAL FEED, 22 INCHES
- SADDLE LENGTH, 24 INCHES
- CROSS FEED, 10½ INCHES
- VERTICAL FEED OF KNEE, 15¼ INCHES
- SPINDLE FEED, 4 INCHES

2 H.P.
SPINDLE
MOTOR



● 2700 LBS.
NET

For . . . Milling, boring, duplicating in tool rooms, model shops, pattern shops, production lines, general machine shops, experimental laboratories, machine shops, schools — wherever high-speed vertical milling is done.

Also available . . . Infinitely variable spindle feed from $\frac{1}{4}$ inch to 8 inches per minute.

Infinitely variable table feed (longitudinal) in 4 ranges: from $\frac{1}{2}$ inch to 60 inches per minute.

Ask for special bulletin, No. 2699, on new Gorton Mastermill and for general catalog, 1703-1655, covering the entire Gorton line.

A.S.T.E. show visitors are cordially invited to visit the Gorton plant in Racine — one hour's ride on the Northwestern Railroad.



GEORGE **GORTON** MACHINE CO.

1703 RACINE STREET

RACINE, WIS., U. S. A.

SINCE 1893. Tracer-Controlled Pantographs, Duplicators — standard and special . . . Horizontal and Vertical Mills, Swiss-Type Screw Machines, Tool Grinders, Small Tools and Accessories.

For more data circle 611 on Reader Service Card

A 8732-1PA

March, 1956

modern machine shop 339

ASTE Exposition . . .

plus or minus 0.000008 or plus or minus 0.000004 inch.

A new tool, the Webber Height Gage, which uses gage blocks as a basis for measurement, will be shown for the first time. Another product to be displayed is the Davidson Surface Inter-

ferometer which checks the flatness of lapped surfaces accurately and economically. Its outstanding feature is the absence of physical contact with the surface being checked, hence the elimination of damage or distortion to the work surface. "Temp-Chek" temperature meters, designed to give quick, accurate temperature readings of liquids, gases or solids, will also be shown.

For more data circle 74 on Reader Service Card

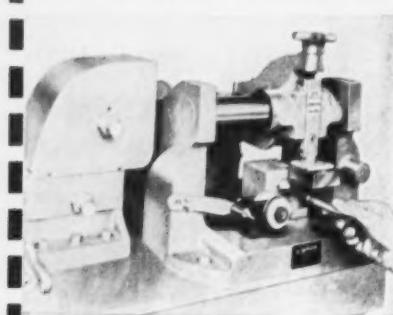
★ ★ ★

STANDARD AND SPECIAL CUTTING TOOLS AND TOOLHOLDERS

In Booth No. 1519, The Gairing Tool Co., 21221 Hoover Rd., Detroit 32, Mich., will exhibit the complete line of standard and special cutting tools and toolholders, including interchangeable counterbores and countersinks, spade drills and core drills, deep hole drills, pack bit boring bars, drill heads (plain and guided), oil inductors, block-type boring tool, E-Con-O-Mills, Chip-Hog heavy-duty turning tools with carbide inserts and Hy-Pressure blade locks. A combination turning, automatic cross facing and center generating tool, which hollow mills two diameters and cross faces a shoulder and, at the same time, generates a 60-degree included center in the end of track rollers, will also be shown. The cutting elements used are standard $\frac{3}{4}$ -inch triangular

MARK 500 or more parts per hour

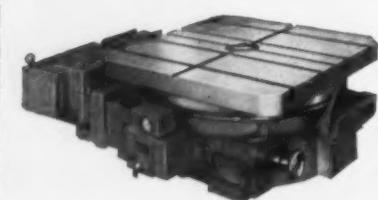
Trade-Mark, Number, Graduate



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TODAY.

The
ACROMARK
Company
"The Original Marking Specialists"
9 Morrell St., Elizabeth, New Jersey

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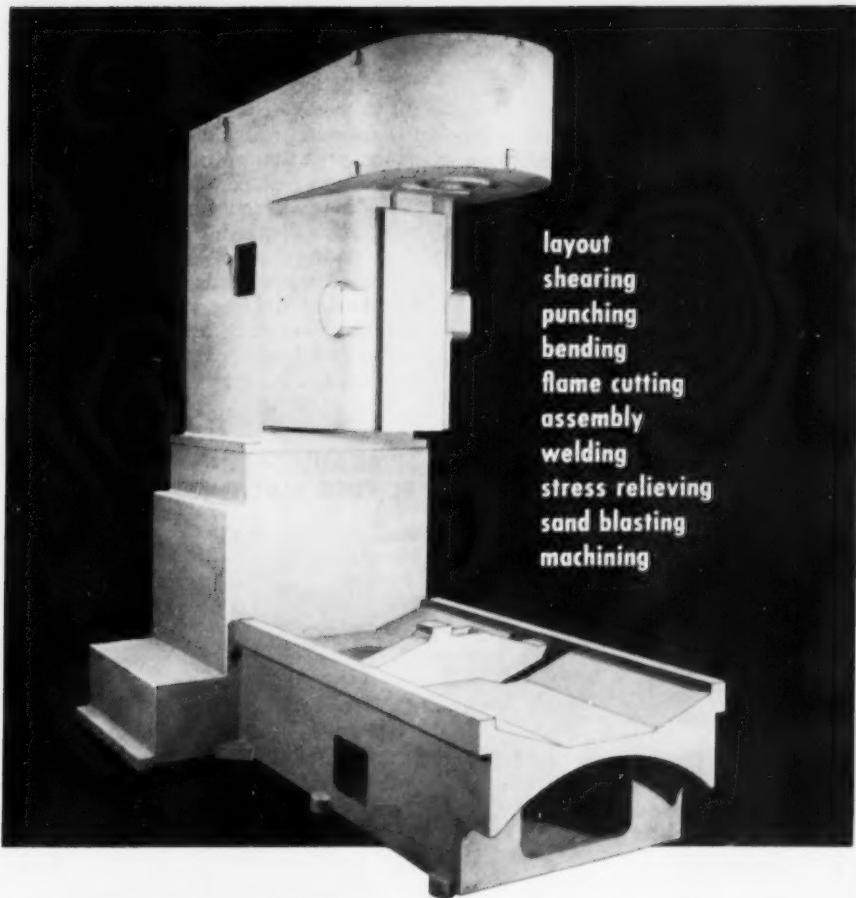


FASTER set-ups and positioning

You save set-up and positioning time with Gilbert rotary tables. *Hand-indexing:* 36" and 50" square or round. *Power rotary and power feed:* 36", 50", 60", and 72" square or round. Special tables built to your requirements. For complete descriptions and specifications, write for Bulletin 854.

THE CINCINNATI **GILBERT** MACHINE TOOL COMPANY • CINCINNATI 23, OHIO

For more data circle 613 on Reader Service Card



layout
shearing
punching
bending
flame cutting
assembly
welding
stress relieving
sand blasting
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LITTLEFORD

complete fabricating

Littleford's complete fabricating facilities free your plant and equipment for your own manufacturing specialty. It's like adding a new building--with 175,000 sq. ft. of floor space, equipped for all kinds of metal fabricating. You'll welcome this additional capacity that'll

keep your assembly lines rolling. And you'll profit from Littleford's experience, particularly in fabricating machine bases, guards and pans. Why not send us your blueprints today for prompt and accurate estimates? Littleford Bros., Inc., 433 E. Pearl St., Cincinnati 2, Ohio.

For more data circle 614 on Reader Service Card

March, 1956

modern machine shop 341

ASTE Exposition . . .

carbide inserts. The tool is never removed from the machine spindle; only the carbide inserts are changed for resharpening.

For more data circle 75 on Reader Service Card



SUPER PRECISION SPINDLES

In Booth No. 830, The Standard Electrical Tool Co., 2487 River Rd., Cincinnati 4, Ohio, will feature a variety of super precision spindles designed for machine tool conversions and for replacement of existing spindles. Also featured will be slides and feeds. The machine tool conversion units include a variety of grinding spindle attachments for boring mill applications; spindles for lathes, planers,

milling machines, grinding machinery, and so on; and milling heads, including a belted motor-driven type and a direct motor-driven water-cooled model for spar and skin milling. A variety of super precision spindles are designed to serve as replacement spindles on existing machine tools of any make or design. Also displayed will be units for the "do-it-yourself" shop, including precision work heads; precision grinding, boring, drilling, milling and routing spindles; work heads; and various slides and feeds.

For more data circle 76 on Reader Service Card



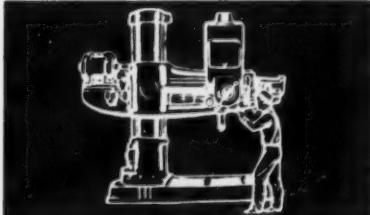
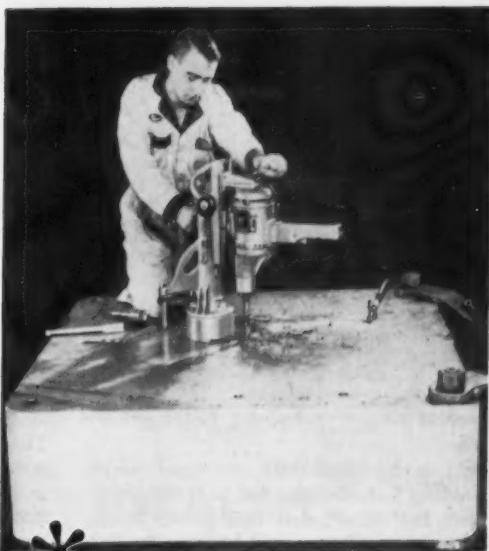
HYDRAULIC-FEED PRECISION BORING MACHINE

Designated as the 2U, a two-way hydraulic-feed precision boring machine with six No. 2 precision boring heads



Variety of Super Precision Spindles offered by Standard Electrical Tool Company

*
here \$235.
does the work
of \$16,000.



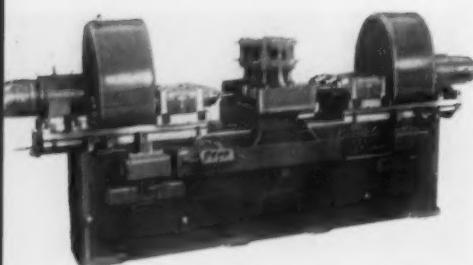
*
BUX
magnetic products

Here's the point: you can replace a \$16,000 drill press with a standard, portable drill and just \$235, the price of a BUX Model L-2 portable, magnetic drill press. On top of that tremendous saving, you can cut your labor costs drastically, too. BUX L-2 goes where you want it to go. Its total weight is only 34 pounds. BUX L-2 delivers up to 1200 pounds **drill bit pressure**, and has 1700 pounds direct lift off strength. BUX L-2 is recommended for drill sizes through $\frac{3}{4}$ " standard. Other models accommodate drill sizes to $1\frac{1}{4}$ " H.D., and have up to 1850 pounds **drill bit pressure**, 2000 pounds direct lift off strength.

Can BUX save money for you? **Yes**, if you drill holes in steel. Your BUX dealer can show you how. Write for fully descriptive literature and the name of your BUX dealer . . . **today**. Write to Buck Mfg. Co., 102 Roberts Road, Los Gatos 1, California.

For more data circle 615 on Reader Service Card

ASTE Exposition . . .



Simplex 2U 2-Way Precision Boring Machine

and a hydraulically clamped workholding fixture designed to hold six pistons for semi-finish and finish boring of wrist pin holes will be displayed in Booth No. 1612 by Simplex Machine Tool Corp., 4548 W. Mitchell St., Milwaukee 46, Wis. The operator loads

one side while the other side is boring, and thus continuous production is afforded. According to the manufacturer, the rated production of the machine is 375 pistons per hour at 100 per cent efficiency.

For more data circle 77 on Reader Service Card

★ ★ ★

OSCILLATING TORQUE MOTOR

A new oscillating torque motor, designed to provide maximum efficiency and long operating life, will be exhibited for the first time in Booth No. 724 by Roto-Mation, Inc., Greenville, Ohio. The new hydraulic-pneumatic device is now being manufactured to meet the increased demands of industry for a simple, powerful and versatile motor that can be applied on industrial machinery, machine tools, construction, material handling and processing and a wide variety of other related

ZIP... ZIP...

CUTS TUBES FAST

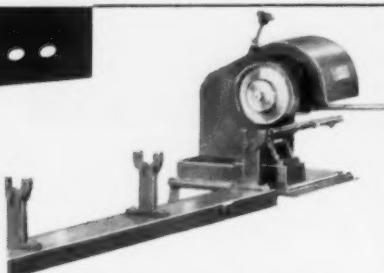
It zips right through tubes from $\frac{3}{8}$ " to 1 $\frac{1}{4}$ " O.D., from light gauge to 16-gauge wall thicknesses. Cuts up to 2,000 pieces an hour, effortlessly, with just a stroke of the handle. Convenient, adjustable table with 5 Dual-Roller Forks. Also available, Cut-Off Machines for pipes and tubes up to 12" diameter, air or hand-operated.

REQUEST YOUR
CONTINENTAL
CATALOG TODAY

Continental MACHINE CO.

SINCE 1919

1952 N. MAUD AVE. • CHICAGO 14, ILL.



and we'll prove it!

Simply send us a sample of your tubes, we'll show you how clean and fast a Continental Rotary No. 1 Cut-Off Machine cuts, and return the pieces for your inspection along with actual time studies.

For more data circle 616 on Reader Service Card

When one welder gives both AC and DC...

Handles every type of electrode...

Yet costs less to buy and operate...

WHY
shouldn't you be
using IDEALARCS
for your production
welding.



IDEALARC...one efficient welder for all your jobs.
Furnished as an AC/DC welder or as a straight AC welder to which DC can be added at any time.

IDEALARC... **industry's most versatile welder**

Certain electrodes work best on AC... others operate better on DC. Some rods that work best on DC in the smaller sizes work best on AC in the larger sizes. With still other rods, the opposite is true. IDEALARC, with its instant selection of AC or DC, gives optimum performance on every type and size of electrode.

There is no other welder like it

THE LINCOLN ELECTRIC COMPANY

Cleveland 17, Ohio

ONE DEPENDABLE SOURCE FOR ALL YOUR WELDING NEEDS

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Dept. 3506,
Cleveland 17, Ohio

- Send me Bulletin 1343 on Idealarc.
 Have representative call.

Company _____

Address _____

City _____

State _____

Name _____

Position _____



For more data circle 617 on Reader Service Card

ASTE Exposition . . .

work. Compact, light and easily adaptable to original equipment or as a replacement unit, the new motor is designed to operate without cylinders, sprockets, chains or complex linkages.

The unit is capable of providing up to 280 degrees rotation for turning, opening, closing, clamping, indexing, feeding, pushing or moving any type of load or mechanism. It operates on air, oil or fire-resistant fluids and withstands heat up to 650 degrees F. High torque ratings and maximum operating efficiency are made possible through newly developed low-loss, vane seals. A double shaft seal arrangement, consisting of a spring-loaded, lip-type wiping seal and a wide rawhide outer seal, insures long trouble-free service.

With the use of proper controls, the rotative speeds of the unit are limited only by the fluid pressure volume. Fittings are designed with large, flange-mounted supply ports that meet all J.I.C. specifications. Bronze nut and thrust bearings are used, and shaft material is made from chrome-vanadium and chrome-moly steel. Precision machining of

NOW . . .

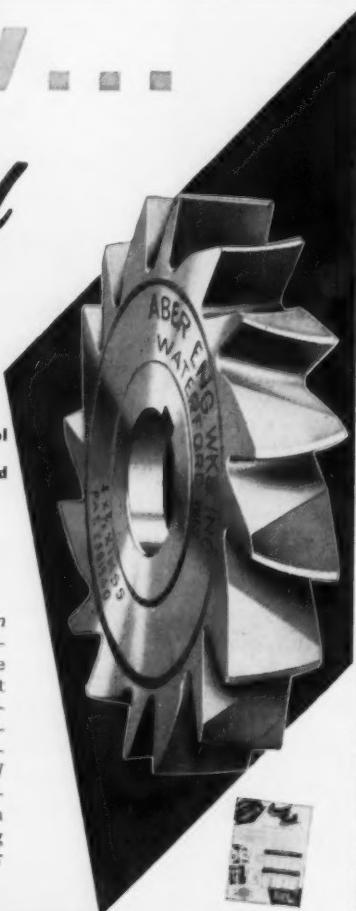
ABER

Curved Tooth

MILLING CUTTERS

1. Give More Accurate Control of Limits and Finish
2. Elimination of Chatter and Breakage
3. Extended Cutter Life
4. Better Performance
5. Increased Production

Patented Curved Tooth Design of all Aber Cutters permits faster, easier operation, because the curve of the tooth face is built up and strengthened at the corner of the tooth which first enters the cut. This makes possible a *SHEARING ACTION* and eliminates the shock of contact with the work. Dissipation of heat is faster, eliminating friction. . . . Write today for complete information.



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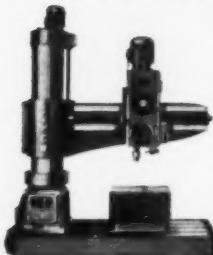
on "How to Sharpen Curved Tooth Milling Cutters" Helpful Cutter Sharpening instructions for your grinding room.

ABER ENGINEERING WORKS
WATERFORD, WISCONSIN

For more data circle 618 on Reader Service Card

**SEE THESE
OUTSTANDING MACHINES
IN OPERATION AT THE
ASTE SHOW**

BOOTHES 1806 and 1907



CASER RADIAL DRILLS

• MODEL FR-10/1250
Other Models FR-7, FR-9, FR-11

FEATURES:

Single push button clamping of column and head • Single control starts, stops and reverses spindle with pre-selection of all speeds while machine is running • Spindle mounted on ball bearing • Head can be locked while machine operated • Single knob feed dial can be operated while machine is running and feed is engaged.

Caser Radial Drills Are Available In The Following Sizes:

ARM LENGTHS: 2' 6" 3' 4' 4' 5' 6' 7' 8'

COL. DIAM.: 8" 10" 12" 14" 16" 17" 22" 22"

The Maserati Corporation of America will demonstrate four of its outstanding machine tools at the ASTE exposition.

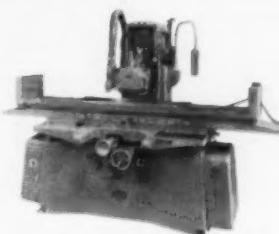
Come and see how efficiently these high-precision, low-cost machines operate. . . . the BLOHM HFS-4 horizontal surface grinder, the CASER FR-1 Radial Drill, the WESTBURY 1-S vertical milling machine and WESTBURY 3-U Horizontal Milling Machine.



**WESTBURY
VERTICAL MILLS**

*The Westbury
1-S and 1-R*

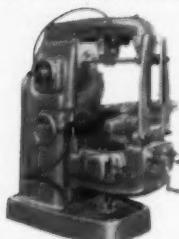
Hardened and ground high-speed ball bearing spindles — 5" quill travel; micrometer depth stop — Three feeds, .0016", .0032", .0064"; Spindle speeds 100 rpm, 8 speeds (60-2713) — Detentated overarm (1-S) — Round overarm (1-R) — Precision angle setting control — Rigidly mounted table — 49½" x 11½" worktable — Spindle range, 10° transverse, 16° vertical — Positive feeds — Motor, 1.5 hp — Weight, 2200 lbs. The Duplicate Duplicating Attachment used for Master Pattern Making. Hydraulic precision reproduction of molds, patterns, and templates, in any material.



WESTBURY HORIZONTAL MILLS

The Westbury 1-U, 3-U, and 3-B

Heat-treated, hardened spindles; all moving parts designed to withstand overloads in excess of 100% — Spindle mounted on adjustable bearings — Spindle speeds 100 rpm, 8 speeds (60-1109 or 25 to 1400 rpm) — Dial and hand control for selecting and reversing — Splash lubricated spindle gear box, extra gear pump for added safety — Power feed and rapid traverse in all directions — Circular table — Special safety devices prevent operating errors — All ways handscrapped — Single lever engages rapid traverse for all movements.



**Representatives
in Principle Cities**

**Write, Wire, or
Telephone for
descriptive literature.**



MASERATI CORPORATION OF AMERICA

WESTBURY, NEW YORK

For more data circle 619 on Reader Service Card

ASTE Exposition . . .

component parts holds concentricity between shaft bearings. The square shape of the new unit facilitates easy mounting on any of six faces, and there are 14 mounting models available and four shaft styles.

All the motor units are said to be complete with standardized controls, fittings and auxiliary devices. Standard

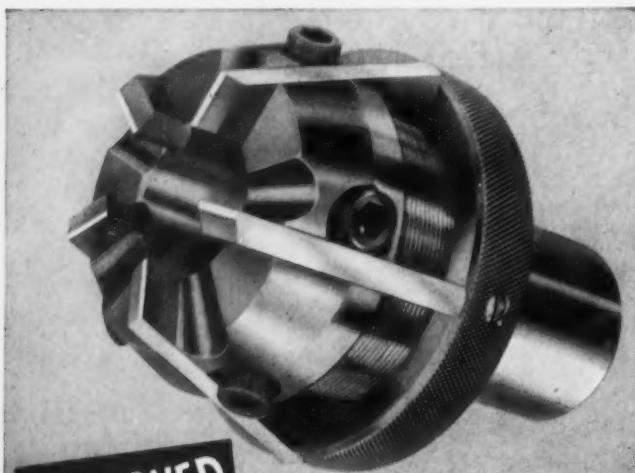
and special sizes are provided for moving loads ranging from a few ounces to many tons.

For more data circle 78 on Reader Service Card

★ ★ ★

MILLING MACHINES

Two completely new milling machines will highlight the display of the U. S. Burke Machine Tool Division, 3 Brotherton Rd., Cincinnati 27, Ohio, in Booth No. 604. Featured in the display is the radically new "Quartet." It is described by the manufacturer as "a complete milling department in one machine." The "Quartet" is a No. 2 horizontal universal knee type unit, which may be used for horizontal, universal, vertical or angular milling operations. The machine is powered by a 3 or 5-h.p. drive motor, providing infinitely variable speeds to the horizontal spindle. The unit is equipped with a heavy-duty turret, which may be swiveled to accommodate the machine to universal milling operations. At the rear of the rectangular-type overarm is mounted an independently



IMPROVED GENESEE Adjustable Hollow Mill

There is a size and style Genesee for every hollow milling job. Standard sizes from 0 to 2", standard with straight or Morse Taper shanks carried in stock.

- Quick — easy adjustment
- Simple sharpening method
- High speed steel—cast-alloy
- Carbide tipped blades
- Let our Engineering Department solve your Production tool problems

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566 HOLLENBECK ST. • ROCHESTER 21, N. Y.

Adjustable Hollow Mills • Facing and Counterboring Tools • Special Production Tools

For more data circle 620 on Reader Service Card

WALLS TU-WAY BELT SANDER



VERTICAL

At last, a top quality industrial sander that provides all the most wanted features - yet sells for so little. **\$89.95**

complete with cord, plug, switch ready to use

Illustrated Literature on Request

A few desirable distributor territories still available.

WALLS SALES CORPORATION

333 Nassau Avenue Brooklyn 22, N. Y.

For more data circle 621 on Reader Service Card



INDUCTION HARDENED PRESS BRAKE DIES

for greater die life at no extra cost
on any make of press brake

Whether it is a simple die for angle bending or the more complex dies for any of the combined bending and forming operations, CHICAGO induction-hardened dies offer bonus performance at no extra cost. Field reports on these dies show better than ten times the useful life of the conventional dies used in press brakes. Get the full particulars on CHICAGO dies for your next press brake job.

4915

Steel Bending Brakes for over 50 Years

DREIS & KRUMP
MANUFACTURING COMPANY

7418 S. Leomis Boulevard, Chicago 36, Illinois

For more data circle 623 on Reader Service Card

March, 1956

DoALL Single Point Carbide Tools, Tips and Holders

- Finest, controlled quality sintered carbide

- Specific grades of carbides to meet every need

- All sizes, shapes

Call DoALL

— consult your classified phone directory for nearest DoALL Service Store that stocks cutting tools, gages, supplies — or Write

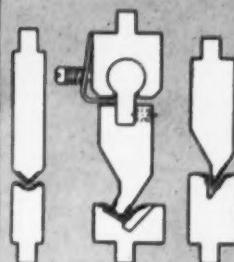
The DoALL Co.

21

DoALL Hefti-Cut Adjustable Tool with DoALL Pre-formed Carbide Blank



For more data circle 622 on Reader Service Card



Heavy lines
indicate
hardened surfaces

CHICAGO
STEEL BENDING BRAKES
BOX AND PAN BRAKES
PRESS BRAKES

**REDUCE THREAD CUTTING COSTS
WITH NEW "ST" THREADING
TOOLS**



Agents wanted.
Exclusive territories available.
Apply in writing or call TA 3-2033 at ASTE SHOW.

Precision
ground
cutters



Any Standard or Special Thread Form can be cut more precisely and economically with type "ST" Threading Tools.

We supply long-life super HSS cutter blades precision ground to any thread form. To resharpen these cutters only grind top face.

Type "ST" Spring and Swivel Threading Tool holders come in 4 sizes to fit any standard toolpost. This is the most dependable Toolholder for cutting a smooth Precision Thread and for easy adjustment of angle of lead. We also carry a full line of internal threading tools.

Write for free catalog to:

R.B.TOOLCO., Inc.

785 North Broadway
White Plains, N. Y.

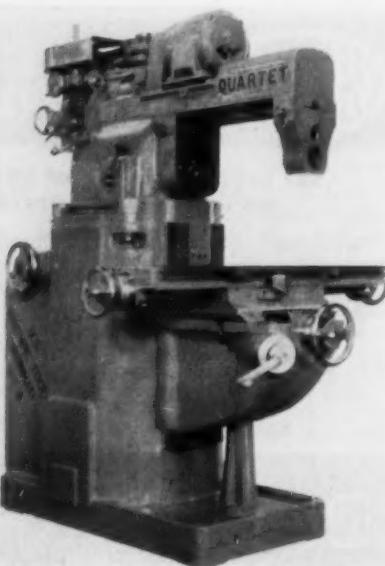
For more data circle 624 on Reader Service Card

ASTE Exposition . . .

driven vertical milling head, with power feed to the quill. For vertical and angular milling, the vertical head is indexed into position over the table.

The second completely new unit to be displayed is the U. S. Vertical Powerfeed Head Milling Machine. This vertical mill has large knee, saddle and table; giant-sized micrometer dials; and is equipped with 1-h.p. reversible motor driving the vertical head. The feed rate of the head is infinitely variable from 0.002 to 0.008 inch per revolution. The new machine features a completely enclosed hard chrome plated quill, with 5½ inches of power travel and 800 pounds of "down thrust."

Two units of the company's standard line, the No. 1 U. S. Hand Milling Machine equipped with an automatic head feed and the No. 4 Burke Univer-



U. S. Burke "Quartet" Milling Machine

SHARP NAMEPLATE MARKING

Model
No. 4



NAMEPLATE DETAIL PRESS.

- Simple Operation
- Perfect Alignment
- Uniform Depth

GEO. T. SCHMIDT, INC.

 1806 W. BELLE PLAINE AVE.
 CHICAGO • 13 • ILLINOIS

For more data circle 625 on Reader Service Card

DoALL

H. S. STEEL END MILLS

Hollow ground spiral flutes afford better
chip removal and
increase tool life.

- Double and Single End Styles
- Straight and Tapered Shanks
- Straight, Corner Rounding and Ball Ends
- Sizes 1/16" to 2"



DoALL has Carbide
End Mills,
too!

The DoALL Co.
Des Plaines, Ill.

20

For more data circle 626 on Reader Service Card

ENGINEERED *Live Centers*



Standard shanks with Morse
tapers carried in stock
send us your specifications
and blueprints — we will
see that your job is set up
with the right LIVE CENTER

For more data circle 627 on Reader Service Card

STURDIMATIC
COMPANY

1904 F STREET • DETROIT 16, MICH.

ASTE Exposition . . .

sal Bench Milling Machine, equipped with a vertical milling attachment, will also be shown. The No. 1 U. S. Hand Mill is a production mill used by both large and small plants for small part milling. Burke Bench Mills are available in both bench and pedestal mounted models. Some models are used for mass production of such industrial

tools as end mills. Others are for toolroom use and for instruction purposes in schools and colleges.

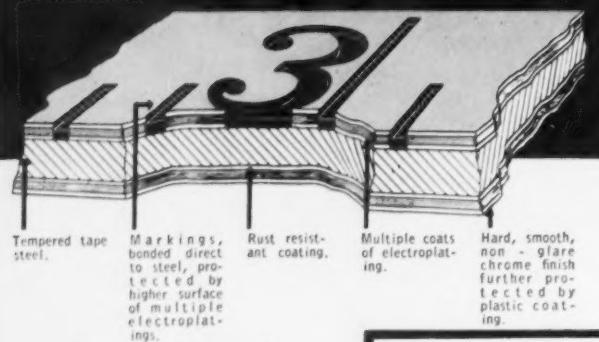
For more data circle 79 on Reader Service Card

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DIMENSIONAL MEASURING SYSTEMS

The most advanced and complete line of dimensional measuring systems, including electronic, air, electric and mechanical, will be exhibited by Federal Products Corp., 6142 Eddy St., Providence, R. I., in Booth No. 496. Several of the very latest developments in electronic and air-electric machine control gaging will be on display, along with the Dimensionair air gages, mechanical dial gages and dial indicators. One of the highlights of the exhibit will be a new series of dial indicators. This outstanding advancement features gears and pinions that have been precision hardened, making the movement virtually maintenance-proof and imparting increased sensitivity as a result of velvet-smooth action.

WHY *LUFKIN* Chrome Clad Steel Tapes last longer



Chrome Clad tape lines, a Lufkin exclusive, won't crack, chip or peel and are rust and corrosion resistant. Their jet black markings are easy to read and won't ever wear off. For longer wear — insist on Lufkin.

BUY *LUFKIN* TAPES • RULES
PRECISION TOOLS
FROM YOUR DISTRIBUTOR

THE LUFKIN RULE COMPANY
Saginaw, Michigan
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418 BETTER MEASURE WITH *LUFKIN*



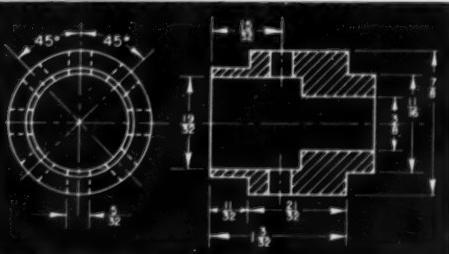
Practical, compact tape rule. 6, 8, 10, and 12 foot lengths. Rugged, heavily plated metal case, D-shape for inside measurements.



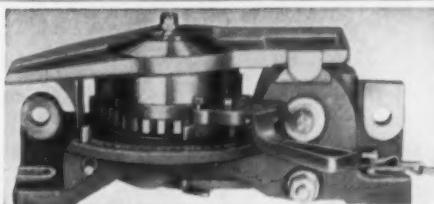
Long steel tape. Metal, rust-resistant case covered with durable maroon vinyl. 25, 50, 75 and 100 foot lengths.

For more data circle 628 on Reader Service Card

**CUT COSTS
ON SECONDARY OPERATIONS
WITH THE
DEARBORN
AUTOMATIC CHUCKING
AND INDEXING FIXTURE**



This piece was made from Brass. It was necessary to drill all holes from the outside to minimize the burring time. Production was about 100 pieces per hour or 800 holes per hour.



Features:

1. Work held by collets
 2. Automatic opening and closing
 3. Work automatically ejected
 4. Automatic indexing if required
 5. Three models with capacities from $1\frac{3}{8}''$ to $2''$

Write for illustrated data.
Send blueprints or specifications
of work.

J. W. DEARBORN
ANSONIA • CONN.

For more data circle 631 on Reader Service Card

ASTE Exposition . . .

Machine control demonstrations will show various types of grinder control—cylindrical, center-type and internal. One of the center-type grinder control units is an air-electric gage with a "jump-on" caliper which engages the work automatically while it is being ground. Size signals are sent to gage

control unit, which controls the rate of wheel feed and retracts the wheel when finish size is reached. Combined gaging for automatic control will be shown in another display. This recently developed technique permits close control over random work-size variation and machine drift for long periods of time, despite critical tolerances. Air-electronic gaging will also be demonstrated. One automatic gage measures the inside diameter of hydraulic valve-lifter cups and segregates them into six good diameter divisions plus undersize and oversize.

Engineered
with the
quality
features
that make
end milling
jobs
PAY OFF!



Engineered with the hardest practical grade of carbide to "breeze" through the toughest metal cutting applications.

Nelco end mills are precision ground all over—from shank to cutting edge.

174 different end mills—diameters from $\frac{1}{4}$ " to 5"—2, 3, 4, or 6 flutes—straight or taper shank—a tool for every application! The complete Nelco end mill line means a tool for every job—from stock—without the delay and cost of a "special".

Your equipment relies on its tooling for production—and in any machine—new or old—Nelco carbide tipped tools really PRODUCE!

Send today for the new Nelco catalog—over 850 tools, 850 ways to better production at less cost.



for that extra EDGE
in production.

NELCO TOOLS

NELCO TOOL CO., Inc. • Manchester, Connecticut

For more data circle 632 on Reader Service Card



PART FEEDER

Automatic Part Feeders are adaptable to production jobs requiring the handling of small parts. Parts poured into hopper are arranged and fed down track in proper order.



Single & Multiple Spindle Magazine Feed Power Screw Driving Machines

For driving screws faster in products assembled with screws. These machines operate easily and require very little attention or adjustment when put in production.

Send sample parts when writing for quotation.

COOK & CHICK CO.

2415 WEST 24TH ST., CHICAGO 8, ILL.

For more data circle 633 on Reader Service Card

DoALL ADJUSTABLE THREAD RING GAGES

remain perfectly round through full range of adjustment and retain setting while in use.

2½ to 12 times longer life—over 50% less weight than conventional gages



Call DoALL — consult classified phone directory for DoALL Service Store that stocks gages, cutting tools, supplies, or Write

The DoALL Co.

Des Plaines, Ill.

15

Also Thread Plug Gages, Cylindrical Plug and Ring Gages, and Master Setting Discs

For more data circle 634 on Reader Service Card

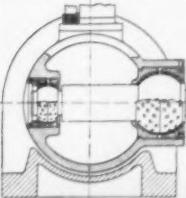
The New LEITZ Optical Dividing Head



A CUSTOMER SPEAKS:

"Without our Optical Dividing Head, we would not even attempt to make the critical indexing work nowadays necessary for things that fly, or mechanisms that must control angular motions to hit targets at a distance, to measure degrees, minutes and seconds, to eliminate angular velocity errors and vibrations in quick running mechanisms, etc."

The LEITZ Optical Dividing Head is the last word in indexing precision. Its construction is different from other optical and mechanical dividing heads on the market. A NEW DOUBLE SPHERICAL BALL BEARING, DOUBLE READING IN THE SAME EYEPIECE 180° APART, motor drive attachment and other features make the LEITZ an important aid required in any shop where precision is demanded.



→ The 2 spherical ends of the spindle are carried in hardened steel cups with several hundred small precision balls held in place by ball cages in such a way that each ball creates its own path. There is no play, either radially or axially, no oil film, no wear and a very large load capacity.

Write for Descriptive Bulletin --- Code GIPAD

Geo. SCHERR OPTICAL TOOLS, Inc. 200-MM LAFAYETTE ST. • NEW YORK 12, N.Y.

For more data circle 635 on Reader Service Card

modern machine shop 355

CHIPS DISSTON SAYS

"Be a Sharp Buyer!"

CHOOSE THE NEW

DISSTON LANCER TOOTH BAND SAW

for high-speed
cutting of
non-ferrous metals



GTPP



LANCER TOOTH

Use this newly designed Disston hard edge blade with positive rake angle tooth. It permits high-speed production cutting of non-ferrous metal, wood and plastic—cuts brass and aluminum solids and Plexiglas with equal ease.



REGULAR TOOTH

Use this fine Disston hard edge flexible back band saw for all ferrous metals and the thinner sections of non-ferrous metal and plastic. Its finer tooth spacing is particularly adapted to sawing angle iron, steel tubing, nickel plate and brass sheets.

Contact your Disston distributor for these and other high quality Disston cutting tools. Get his expert advice on selecting the right tool for your application.

Henry DISSTON DIVISION

H. K. Porter Company, Inc.



321 Tacony, Philadelphia 35, Pa.

For more data circle 636 on Reader Service Card

356 modern machine shop

ASTE Exposition . . .

complete line of dial indicator gages for checking every dimensional condition will also be exhibited.

For more data circle 80 on Reader Service Card

★ ★ *

AUTOMATIC GEAR GAGING AND SORTING MACHINE

A unique Red Ring gear gaging and sorting machine, as well as a wide variety of broaches and broaching fixtures, will be featured in Booth No. 816 by National Broach and Machine Co., 5600 St. Jean Ave., Detroit 13, Mich. The Model GRD gear gaging and sorting machine will be checking and sorting small automotive pinions automatically for tooth size accuracy. The machine will have a transparent plastic cover and mirror arrangement



Red Ring Gear Gaging and Sorting Machine

March, 1956

Why SCHNORR Disc Springs?

Because:



1. Unlimited life within borders of permissible loads.
 2. No creeping, initial setting or gradual fatigue.
 3. Axial center pressure.
 4. Exact adjustment to the desired pressure.
 5. Small constructional height, large deflection.
 6. Large inherent damping.
 7. Large impact damping especially with multiple stacking.
 8. Excellent space disposition.
 9. Spring pressure, Spring length and Spring deflection can be easily determined for the same Spring size or can be changed by lengthening or shortening of the Spring columns or by multiple stacking. In special cases the character line can be made to divert from its usual straight form by diversified stacking.
 10. Most Spring sizes available from stock.
- * For descriptive literature write

See us at ASTE Booth 162

KARL A. NEISE

404 4TH AVE., Dept. MMS, NEW YORK 16, N.Y.

For more data circle 637 on Reader Service Card

Look at those smooth, uniform chips!

DoALL
XL TWIST DRILLS

Guaranteed to last longer
than an ordinary drill!



See your classified phone directory for nearest DoALL Sales-Service Store stocking cutting tools, gages, supplies

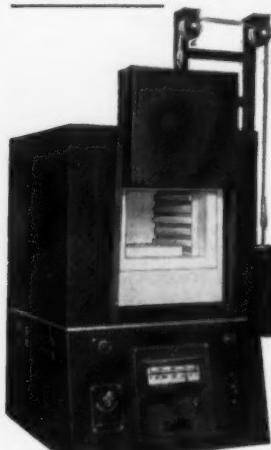
or Write

- Lower tool cost
 - Less downtime
 - Lower labor cost
 - All sizes in stock
- Try just one for comparison

The DoALL Company
Des Plaines, Illinois

For more data circle 638 on Reader Service Card

Designed for TOOL ROOM EFFICIENCY



HUPPERT Heat Treating FURNACE

Range: 300° F. to 2000° F.

Years of satisfactory operation in tool, die and machine shops, as well as laboratories have proven these furnaces to be ideal for production work. Huppert special features include High Temperature, Heavy Duty Kanthal elements—Multi-insulation—counterweighted and tight self-sealing door. Pilot lights indicate furnace operation. All connections factory installed, shipped ready for operation.

| Model No. | Inside Dimensions | | | KW | Prices | |
|-----------|-------------------|------|------|----|-------------------------------|--|
| | Wide | High | Deep | | with Huppert input controller | with electronic temperature controller |
| 869 | 8" | 6" | 9" | 4 | \$280.00 | \$480.00 |
| 11 | 8" | 6" | 12" | 4 | 298.00 | 506.00 |
| 12* | 8" | 8" | 12" | 6 | 382.00 | 590.00 |
| 12A* | 8" | 8" | 18" | 9 | 490.00 | 698.00 |

*For 2300° F. add \$95.00 to No. 12 and \$105.00 to No. 12A.
No. 12A can be furnished for 3 phase at no additional cost.
For floor model add \$52.00 to above prices.

K. H. HUPPERT CO.

6841 Cottage Grove Avenue
Manufacturers of Electric Furnaces and Ovens

Chicago 37, Illinois

For more data circle 639 on Reader Service Card

• Write for literature on complete line of furnaces and ovens. Ask for Hints on Heat Treating.

March, 1956

modern machine shop 357

ASTE Exposition . . .

to show how the gage checks parts to tenths of a thousandth accuracy, sorts them according to undersize, oversize or "OK" specifications, and shuts down a gear production machine if more than a given number of rejects of a specific type are successively produced.

Roughing and finishing broaches that produce internal helical involute gears without subsequent tooth finishing operations will be on display, along with a variety of other broaches that produce round and splined holes. Red Ring shaving cutters will also be exhibited. Pictorial illustrations of new Red Ring broaching fixtures for broaching jet engine blades, as well as slots and dovetails in other production parts, will form the backdrop of the booth.

For more data circle 81 on Reader Service Card



TOGGLE-ACTION CLAMPS

Lapeer Mfg. Co., 3048 Davison Rd., Lapeer, Mich., will feature its complete line of toggle action clamps in Booth No. 5531. Prominently featured in the exhibit will be the company's heavy-duty clamps, which can be either air or oil operated.

For more data circle 82 on Reader Service Card



UNIVERSAL PIPE THREAD ROLLING ATTACHMENT

Salvo Tool and Engineering Co., 26441 Gratiot Ave., Roseville, Mich., will exhibit in Booth No. 1814 its new universal pipe thread rolling attachments, plus several other models of standard thread rolling units and thread rolls suitable for use on prac-

Precision Sharpen Your Die-Sinking Cutters on an ALEXANDER Bench Grinder!

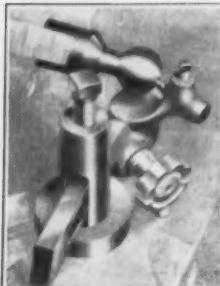


Over 1,000 sold in United States.

Write to Dept. C for catalog.

J. ARTHUR DEAKIN & SON
150-28 Hillside Ave., Jamaica 32, N. Y.

For more data circle 640 on Reader Service Card



Monarch Precision SHAPLANE Radius Tools

Illustration shows convex cutter for $\frac{1}{4}$ " to $2\frac{1}{2}$ " balls.

FIVE MODELS for LATHES, SHAPERS, PLANERS, BORING MILLS

Range $\frac{1}{2}$ " to 3" for concave Radii. Also heavy duty models for radii to 6" on planers, etc.

PATENT
PENDING

Write for circular

C. B. TEETER, TOOL ROOM SPECIALTIES

4470 Oakenwald Ave., Chicago 15, Ill.

For more data circle 541 on Reader Service Card

ENGRAVING MACHINES FLOOR and BENCH MODELS



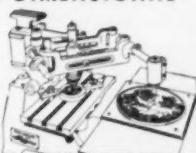
FOR 2 AND 3 DIMENSIONAL ENGRAVING

Highly efficient precision machines for engraving steel, other metals and plastics. You're always safe in buying PREIS-PANTO Engraving Machines and Accessories.

TRADE MARK



H. P. PREIS ENGRAVING MACHINE CO.
657 U. S. Route 22
Hillside, N. J.



Write for catalog and prices.

For immediate attention write directly to manufacturer below. Ask for nearest representative.

You Can Cut Cost Per Hole with DoALL Reamers because:

1. Special processing gives more holes per grind.

2. Faster feeds can be used.

3. DoALL stocks more sizes and types than anyone else.



H. S. Steel



Carbide

Call DoALL — consult classified directory for nearest DoALL Service-Store that stocks cutting tools, gages, supplies — or Write

The DoALL Co.
Des Plaines, Ill.

18

For more data circle 642 on Reader Service Card For more data circle 643 on Reader Service Card

Commander TAPPER

- Wider Range . . . 1 Tapper Handles No. 0 to $\frac{3}{4}$ " Taps
- Automatic Tap Protection
- Furnished to fit any Drill Press

Commander — "The Tapper That Thinks For Its Operator," has the adjustable full range torque control that instantly stops any tap when it becomes dull, loaded, strikes a hard spot or bottoms in blind hole tapping. Assures maximum tap protection, higher production, even with inexperienced operators.

Your nearby Commander Distributor can give you a demonstration in your own plant. Write for his name and a copy of the NEW Commander Full Line Catalog.

COMMANDER MFG. CO.
4224 W. Kinzie St.

Chicago 24, Ill.



Any operator does precision tapping with a Commander TAPPER

Product of Commander . . . Builder of the Multi-Drill

SEE US AT BOOTH #800, A.S.T.E. SHOW, INTERNATIONAL AMPHITHEATRE, CHICAGO, MARCH 19-23

For more data circle 644 on Reader Service Card

ASTE Exposition . . .

tically all types of hand and automatic screw machines, lathes, Bullards and other turning machines. In addition, the display will include a typical hydraulic cross-slide for turret lathes and similar machines. Standard and specially engineered cross slides built by Salvo permit installation of thread rolling and oil grooving equipment, form-

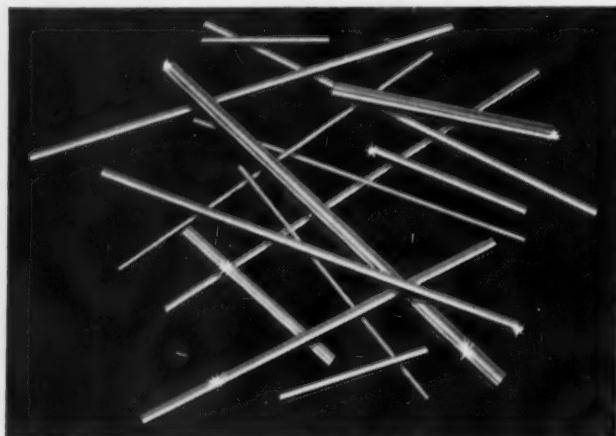
ing and cut-off tools, and so on, on all types of machines not already equipped to perform these operations.

For more data circle 83 on Reader Service Card



PRECISION CHECKING INSTRUMENTS

A demonstration that makes the expression, "Alike as peas in a pod," will be given in Booth No. 1030 by The Chicago Dial Indicator Co., 180 N. Wacker Drive, Chicago 6, Ill., with a display of precision checking instruments that will measure variations as small as 0.0001 inch on parts taken from mass production runs. The demonstration will point out the need for precision checking instruments throughout the entire range of production to maintain tolerances within prescribed limits, so



1001 USES for ACE

HARDENED H.S.S. DRILL BLANKS!

Available now in 148 low-cost standard sizes to meet your exact requirements!

"Versatile!" Yes, that's one word for Ace Drill Blanks. And "economical" is another. Because they're "all-purpose" tools that you can readily use in countless different ways. Properly heat-treated to uniform hardness, then precision ground to size, they're ideal as punches, dowels, knock-out pins, and gages. Perfect for rollers, too, on high temperature applications. And you'll find they can be quickly, easily, economically adapted to a wide range of end-cutting tool applications to save time, step up production, and reduce costs! Call your distributor today!

A 56 PAGE, illustrated catalog (No. 52 F) containing complete information on the entire line of ACE Drills and hardened H.S.S. drill blanks is yours for the asking. Send for it today!



ACE DRILL

ADRIAN, MICHIGAN

ORIGINATORS OF "GROUND-FROM-THE-SOLID" DRILLS

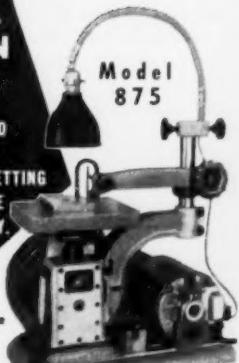
For more data circle 645 on Reader Service Card



Geneva Model No.
145F Dial Indicator

Only the ALL AMERICAN

PRECISION FILING MACHINE HAS THE PATENTED BALL AND SOCKET JOINT FILE CLAMP WITH FILE SETTING SQUARE TO INSURE INSTANT ACCURACY.



COMPLETE
WITHOUT LAMP OR TOOLS
F.O.B. OUR PLANT \$150.

SEND FOR LITERATURE

MANUFACTURERS OF ALL AMERICAN VIBRATION FATIGUE TEST MACHINES



ALL AMERICAN
Tool & Manufacturing Co.

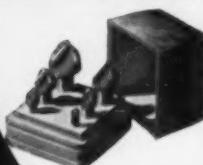
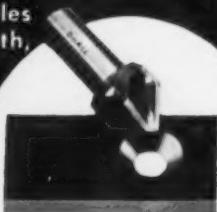
8043 LAWNDALE AVE., SKOKIE, ILLINOIS

For more data circle 646 on Reader Service Card

DoALL CHATTER FREE COUNTERSINKS

...produce holes with a smooth, valve-seat appearance

New off-center flute design. Shears metal — does not gouge. Provides faster, more accurate cutting. Lasts longer. Available in H. S. Steel.



Call DoAll

see classified phone directory for nearest DoAll Service-Store— complete stock of gages, cutting tools, supplies.

Or Write:
The DoAll Co.
Box 111 — 111

Sets available
in 60°, 82°,
90°, 100°,
120°,
angles

25

For more data circle 647 on Reader Service Card



STERLING
Model "DV"
Variable Angle
DRILL GRINDER

ONE Drill Grinder Sharpens ALL Drills

- 90° to 140° Included Angle
- 1/8" to 2 1/2" Diameter
- 2-3-4 Flutes
- Without Chucks or Collets

Write for complete
information on the STERLING
Model "DV" Drill Grinder

McDONOUGH MFG. CO.
1521 GALLOWAY • EAU CLAIRE, WISCONSIN

For more data circle 648 on Reader Service Card

ASTE Exposition . . .

essential for today's mass production and automatic machining industries. One instrument is so precise it is used to check the hardness of the human eyeball. Among the instruments featured in the display will be the Geneva

JIG BORING

and

Large Precision Machining

Done to your specifications

We Have 21 Jig Borers

KIDDE PRECISION TOOL CORP.

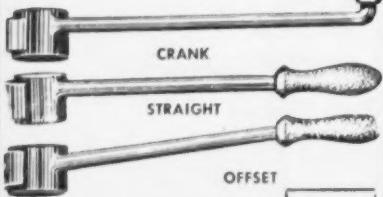
15 LOCUST AVENUE, ROSELAND, N. J.

For more data circle 649 on Reader Service Card

REID

TOOL ROOM ACCESSORIES

MALLEABLE MACHINE HANDLES



Finest and most complete available. Made in 3 styles and in a large variety of sizes. Well proportioned. Neat in appearance. Smooth finish. Stands up under severe usage. Low prices. ALSO plastic and steel ball handles. C.I. hand knobs, compression springs, etc. Finest quality. Low prices.

REID TOOL SUPPLY CO.
MUSKEGON HEIGHTS, MICHIGAN

For more data circle 650 on Reader Service Card

dial indicators, dial indicator test set, bench center set, test set with magnetic base, regular tests, bench gages and dial snap gages. Features of the Geneva dial indicators, such as the continuous and balanced reading dials for 0.001, 0.0005 and 0.0001-inch graduations, threaded stems for special fixtures, and special internal lever movements which eliminate complex gears and increase accuracy, will be clearly demonstrated.

Dial snap gages in several models will be shown for making exacting comparison between workpieces and close specifications. Geneva depth gages, although principally designed for use by photo-engravers, electrotypers and printers, also allow tool engineers to make precise measurement of depths on stampings, shallow slots and offsets. For more data circle 84 on Reader Service Card



AIR-OPERATED ROTARY TABLE

In Booth No. 515, The Vulcan Tool Co., 710 Lorain Ave., Dayton, Ohio, will display successful application of another air operated tool, this time a rotary table for surface grinders. The table uses regular air line sources for power and attains variable speeds of from 40 to 100 r.p.m. The unit is an inexpensive portable attachment for the surface grinding of flanged studs or bushings, bearing spacers, forming rolls

STANDARDIZED MICRO DRILL GUIDES

All standard body styles available with hole sizes from $\frac{1}{8}$ to $\frac{3}{16}$. Tolerances of .0002 maintained on I.D., O.D., and concentricity.

ENGINEERED MICRO-TOOLING, DRILLS, JIGS, COLLETS, ETC.

MICRO
DRILL
GUIDE

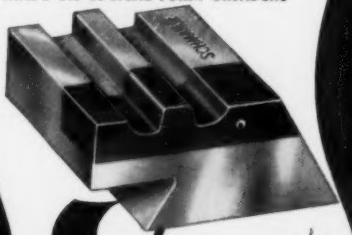


3980
Superior Ave.,
Cincinnati 36,
Ohio

For more data circle 651 on Reader Service Card

GREATER ACCURACY FINER FINISH

MADE ON OPTICAL FORM GRINDERS



Schmarje FORM TOOLS

3 Styles

- FLAT
- DOVETAIL
- CIRCULAR

Send drawings for Prompt Quotations

SCHMARJE TOOL & ENGINEERING CO.

Carbide Reamers • Form Tools

MUSCATINE 7, IOWA

For more data circle 652 on Reader Service Card

ROYAL Self-Releasing Collets with Clover Leaf Grind

Royal specialization pays off. The new Royal self-releasing collets have won wide acclaim for their ease of handling and production savings. Specify Royal and get these plus features at no extra cost!

*Also Milling Machine Types 9B&S,
7B&S, 2MT, RB

*Special Collets Made To Order

a new concept in COLLET DESIGN

by ROYAL

- Real spring tension
- Wider opening
- No gauge fit for secondary operations
- Parallel bearing surfaces prevent wear
- No binding on closing and releasing
- Properly heat treated
- Made of selected steel
- Rigidly inspected



Write or call today for literature and price list on Royal Self-Releasing Collets, Handwheel Draw Bars, and Spring, Step, and Milling Machine Type Collets.

ROYAL PRODUCTS, 84 Union Street, Mineola, L. I., N. Y., Pioneer 6-4245

For more data circle 654 on Reader Service Card

March, 1956

modern machine shop 363

DoALL Air Hardening Precision Tool and Die Steel (Ground Flat Stock)

- Wears up to 50% longer than oil hardening steel

- Contains chrome, molybdenum, vanadium

- Ask about new DoALL "SPRAY-ON" steel ink for layouts



Call DoALL —
Consult classified
phone directory for
the DoALL Sales-
Service Store nearest you

The DoALL Co.
Des Plaines, Ill.

For longer wearing tools
and dies... Just ink it,
mark it and saw it.

Air and oil
hardening... over
1000 sizes.

Available in
5C, 3C,
3AT, 6AT



ASTE Exposition . . .

(angle or radius), convex or concave surfaces, flush pin gages, punches or dies (radius or angles). The table is available in 6 and 10 inch diameters. With the Vulcan Rotary Table, only the machine cross feed is used, minimizing machine error and producing

WADE ENVELOPES

protect
Shop Orders, Drawings,
Blueprints, Etc.

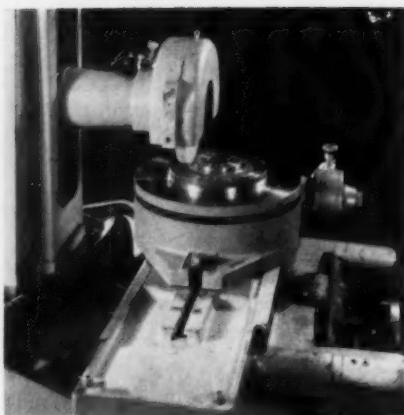
Two styles. No. 2 with fibre back, No. 3 transparent both sides. Non-inflammable acetate windows. Special style or size to order.

Write for details.

WADE INSTRUMENT COMPANY

Dept. M, R.F.D. No. 1, Chardon, Ohio

For more data circle 655 on Reader Service Card



Vulcan Rotary Table in use on grinder

time saving precision grinding or fine micro finishes on tool or production items.

The table can be used on a sine plate or angle fixture utilizing a standard surface grinder wheel, eliminating the dressing of large external wheels for side grinding. Precision built throughout, the table can be used with standard permanent magnetic chucks or simple fixtures to suit the part.

In connection with the rotary table, lapping plates for the conversion of the table into a portable or bench type lapping machine will also be shown. By mounting the lapping plate on top of the rotary table, an inexpensive lapping machine is available for use any-

CUTTING STOCK DIAMETERS UP TO 40 INCHES?

USE

Skee-Anthony

(PATENTED)

CUTTING OFF
TOOLS
for . . .

- ★ BORING
MILLS
- ★ LATHES
- ★ PLANERS
- ★ SHAPERS



THE
LEADER
FOR 14 YEARS

Patented Pivoting Trunnion, Safety-Slip and Support Blade prevent blade breakage and injury to operator. Fast adjustment to lathe center.

Write for free descriptive folder A-1

-SKEE TOOL COMPANY

1406 N. FLORES ST.
SAN ANTONIO, TEXAS

• Few Industrial Areas Open for Representatives •

For more data circle 656 on Reader Service Card

364 modern machine shop



DRILL THESE HOLES

BY A QUICK, EASY, INEXPENSIVE METHOD
Your business letterhead will bring literature.

WATTS BROS. TOOL WORKS

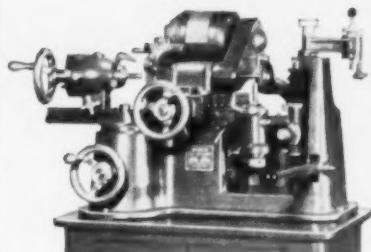
Wilmerton, Pa.

For more data circle 657 on Reader Service Card

March, 1956

HYBCO TAP GRINDER

Sharpens Chamfers, Flutes
and Spiral Points



MODEL 1100

- Capacities No. 0 Machine Screw to 1½" Hand Taps.

HENRY P. BOGGIS & CO.
708 E. 163rd St., Cleveland 10, Ohio

For more data circle 658 on Reader Service Card

NEW DoALL Demon High Speed Steel SAW BANDS

- Up to 10 times faster cutting!
- Up to 30 times longer life!
- Full safety blade



—see directory
for nearest DoALL
Service-Store that
stocks cutting tools,
gages, supplies.

or Write

The DoALL Co.
Des Plaines, Ill.

1/8" to 1"
4 - 2 to 10 pitch



Demon Precision

Demon Buttress

For more data circle 659 on Reader Service Card

FREE—New Bulletin T-1 shows, describes
VAILL tube end forming machine
VERSATILITY for . . .

Beading • Flaring • Flanging
Sinking • Expanding • Grooving
Threading • Reducing
• Double Lap Flaring
• Double Lap Flanging
on Tubing up to 6" Diam.



VAILL
TUBE END-FORMING MACHINES
shape and form tube ends
fast... accurate... at less cost

THE VAILL ENGINEERING CO. 133 E. MAIN STREET WATERBURY 20, CONN.

For more data circle 660 on Reader Service Card

4 Reasons why you should use **GAMMONS DIE REAMERS**



BOOTH 907 • ASTE
SHOW



Rapid cutting capacity.



Tapers per inch .005,
.008, -.013 in stock.



Large range of stand-
ard sizes in stock at all
times for your conveni-
ence.

WRITE FOR
COMPLETE INFORMATION

GAMMONS • HOAGLUND CO.

MANCHESTER 2,

CONN.
Manufacturers of helical taper pins, chucking,
die makers and special reamers.

For more data circle 661 on Reader Service Card

366 modern machine shop

ASTE Exposition . . .

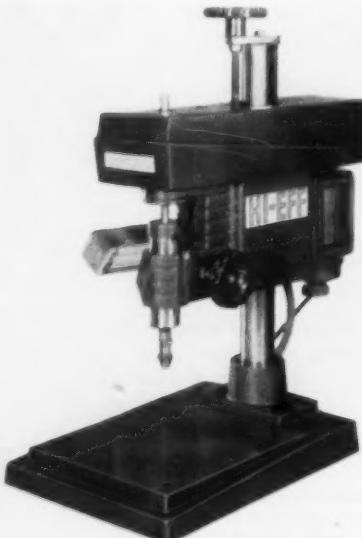
where in the toolroom. For close tolerances on valve plates, seal plates or other surfaces requiring smooth surfaces or micro finishes, the combination provides a dual purpose portable machine for lapping, as well as powered rotary table for various grinding operations.

For more data circle 85 on Reader Service Card

★ ★ *

SENSITIVE DRILLING MACHINE

The "Hi-Eff" Series C Model 64 Sensitive Drilling Machine will be featured in Booth No. 779 by Taylor Dynamometer & Machine Co., 6411 River Parkway, Milwaukee 13, Wis. Like its companion units, the Series A and Series B machines, the new unit is designed for high quality, sensitive, precision drilling on a production basis. How-



Taylor "Hi-Eff" Series C Model 64 Drill

March, 1956

KEO**CENTER
REAMERS**

-
- HIGH SPEED
STEEL**
-
- 3 FLUTES**

Cuts from $\frac{1}{4}$ " to 1". Furnished with 60, 82, 90, 100, 110 or 120 degree included angle. Large stocks on hand. Other angles are special. Let us quote.

Jobbers' Inquiries Invited**KEO CUTTERS**

19326 Woodward - Detroit 3 Mich.

For more data circle 662 on Reader Service Card

ULTRA-CHEX GAGE BLOCKS*for Every
Need!*Supplied in one
Superior Accuracy **5 MILLIONTHS \pm ACCURACY**

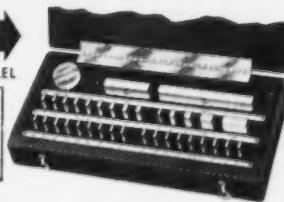
34 Block Set
\$132.50

WITHOUT OPTICAL PARALLEL

**QUICK
DELIVERY
ON ALL SETS**

**82 Block Set****\$303.00 Complete**

This Set will supply the needs of any discriminating shop that must work to gage-block precision.



9 Block Set
\$24.75

OPTICAL PARALLEL **\$6.00**

All Sets at "Money Saving Prices" due to Mass Production Methods.

WRITE FOR FULLY ILLUSTRATED CATALOG -- Code GIPFY

200-MM LAFAYETTE ST. • NEW YORK 12, N.Y.

GEORGE SCHERR CO., Inc.

For more data circle 664 on Reader Service Card

March, 1956

modern machine shop 367

**DoALL Granite
SURFACE PLATES**Non-Rusting • Non-Magnetic • Utmost
Accuracy • Cheaper Than Metal Plates

- Wear Free
- Shock Proof
- Harder than hardened steel
- Velvet Smooth

- Unsurpassed for
Production,
Inspection
and
Layout Work

SIZES SHAPES AND
ACCURACIES FOR
EVERY REQUIREMENTINDIVIDUAL
Working Flats
only \$22.50 Ea.

DoALL

2" x 8" x 12"

.0002" Surface Accuracy

Consult your yellow
Directory for location of
nearest of the thirty-eight
DoALL Sales-Service Stores
that stock complete metal
working necessities.

Call or Write
The DoALL Co.

10 Des Plaines, Ill.

For more data circle 663 on Reader Service Card

ASTE Exposition . . .

ever, the Model 64 will be available at a lower price than other Taylor drilling machines. In the Model 64, the combined runout of the spindle and chuck is held to 0.0005 inch or better, with variable spindle speeds from 800 to 10,000 r.p.m. The range of holes that

HAND KNOBS



6 SIZES CAST-IRON

Tapped, Reamed
or Blank
Hex-shaped hub for
extra tightening

Write for catalog

**TIETZMANN TOOL
CORPORATION**

DEPT. HK-1

ENGLEWOOD, OHIO

For more data circle 665 on Reader Service Card

COOPER WEYMOUTH VARIABLE SPEED STOCK STRAIGHTENERS

Portable cabinet units in sizes 6" up to 24". Constant or variable speed drives with forward, reverse and cut-out switch. Five, seven or nine straightening rolls. Pinch rolls and all bottom straightening rolls power driven.

See Booth 208

A.S.T.E. Show



**COOPER
WEYMOUTH
INC.**

277 NOBLE AVE. • BRIDGEPORT 8, CONN.

For more data circle 666 on Reader Service Card

can be drilled is from 0.001 to 0.125 inch. The machine is very compact, and the housing, pedestal and base have been given clean-cut, modern lines.

Also displayed will be the "Hi-Eff" Model SB Static Balancing Machine with "Speed-Button" Control. The machine is available in six sizes to handle workpieces up to 60 inches in diameter. It is said to be ideal for balancing fans, flywheels, impellers, grinding wheels, couplings, sheaves, pumps, clutches, and similar products.

For more data circle 86 on Reader Service Card

★ ★ ★

RADIUS GRINDING FIXTURE AND ADJUSTABLE HOLDERS AND TOOLS

In Booth No. 174, Apex Tool & Cutter Co., Shelton 15, Conn., will feature a general purpose radius grinding fixture and double-locking, shankless, serrated, adjustable holders and tools. According to the manufacturer, the newly developed radius grinding fixture allows for redressing tools. Adapter heads for holding the shankless, round shank or square tool bits are interchangeable on the fixture by removing one screw only. The fixture can be used on any tool and cutter grinder which has infeed.

The double-locking type of holder and tool is said to permit the extra heavy roughing work on planers with

A Real Spring Winder!



Will earn its cost in
one day. The Hjorth
Perfection Spring
Winder offers the

Ideal means of winding extension, compres-
sion, torsion, taper, double taper, or left
hand springs. Try one in your shop. You'll
like it and the price is reasonable.

- No. 1 Capacity 0 thru 3/32" wire \$1.50
- No. 2 Capacity 0 thru 3/16" wire \$3.00
- No. 3 Capacity 0 thru 5/16" wire \$5.00

**HJORTH LATHE & TOOL CO.
10 BEACON STREET**

WOBURN, MASS.

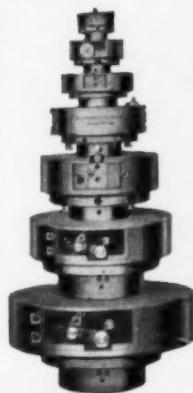
For more data circle 667 on Reader Service Card

MUMMERT-DIXON FACINGHEADS

Two-way tool feed
in 9, 12, 16, 20, 24,
30, 36, 40 and 46
sizes.

One-way tool feed
in 6, 9 and 12 sizes.
Automatic feed —
convenient tool ad-
justment — quick
feed reverse. Save
time and costly set-
ups.

Write for
folder.



MUMMERT-DIXON CO.
120 PHILADELPHIA ST. • HANOVER, PA.

For more data circle 668 on Reader Service Card

DoALL ENGINEERED HSS CUTTERS

Increase Milling Production
because:

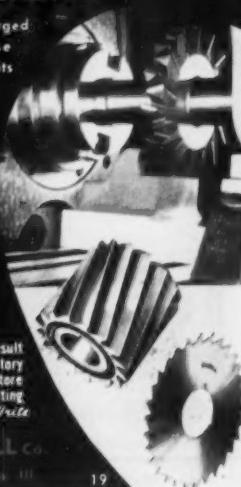
- Made from forged
blanks — dense
structure permits
finer edges
- Vapor blasted
to remove
burrs, in-
crease life
- 64-65 "C"
scale hard-
ness guar-
anteed

Call DoALL — consult
classified phone directory
for DoALL Service-Store
that stocks gages, cutting
tools, supplies, etc. Write

The DoALL Co.

Dane, Wisconsin, U.S.A.

19



For more data circle 669 on Reader Service Card

MARVECO LIVE CENTERS AGAIN CUT PRICES

| | OLD PRICE | NEW PRICE |
|----------------|-----------|-----------|
| MODEL BX | \$ 70.00 | \$ 60.00 |
| MODEL C | \$ 82.00 | \$ 70.00 |
| MODEL CX | \$110.00 | \$ 96.00 |
| MODEL D | \$140.00 | \$120.00 |
| MODEL DX | \$160.00 | \$136.00 |
| MODEL E | \$170.00 | \$146.00 |
| MODEL EX | \$200.00 | \$172.00 |

CALL YOUR LOCAL DISTRIBUTOR OR WIRE

MARVEL TOOL & MACHINE CO.
1092 NO. RIVER ROAD ST. CLAIR, MICH.

For more data circle 670 on Reader Service Card

ASTE Exposition . . .

the use of the button-type carbide plug. This plug can be indexed for use of new cutting edges before regrinding. Other standard shape tools can be used in this holder for various operations. The tools can be interchanged without removing the holder from the machine.

**APPLY LAYOUT BLUE
The Easy Way!**



HANDY ELLISCO BRUSH TOP CANS MAKE IT EASIER FOR YOU TO APPLY AND STORE LAYOUT BLUE BRUSH KEEPS MOIST IN CAN. CONTENTS WON'T DRY OUT 3 OZ. TO 1 QT. CAPACITIES. GET DETAILS AND BULLETIN NO. 60A.

George D. Ellis & Sons, Inc.
4024 N. American St., Philadelphia 40, Pa.

For more data circle 671 on Reader Service Card

TWO MIGHTY MITES



**The ROTARY TABLE,
CS-67,**
has a 5" working surface and a 1½" overall height.

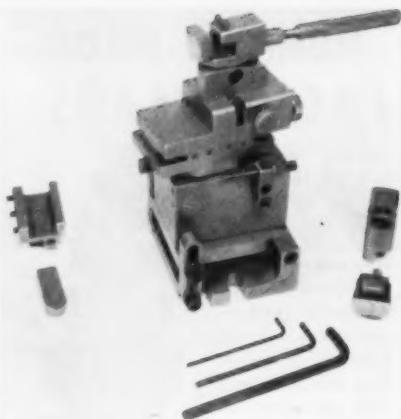
**DIVIDING HEAD,
CS-65,**
is a standard 40:1 ratio crank indexing. Overall dimensions with 2½-inch 3-jaw chuck — 4" x 4½" x 4¾".

Folder upon request.

Custom
SCIENTIFIC INSTRUMENTS, INC.
541 DEVON STREET KEARNY, N. J.

For more data circle 672 on Reader Service Card

370 modern machine shop



View of Apex Radius Grinding Fixture

Other products to be shown include standard and special toolholders, both of the serrated adjustable and round shank styles; tool bits of drop forged high speed and cobalt steel and carbide-tipped tools; single and multiple-purpose milling cutters with tapered serrated blades drop forged of high speed or cobalt steel; carbide-tipped milling cutters; and railroad tools.

For more data circle 87 on Reader Service Card

★ ★ ★

CHUCKING REAMERS

In Booth No. 241, Twentieth Century Mfg. Co., Box 429M, Libertyville,

EARN \$1000 MONTH

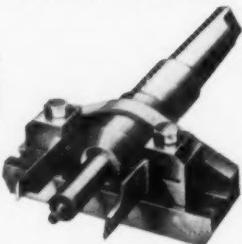
TOOL AND DIE DESIGNERS ARE IN DEMAND—and Acme is the *only* school in America offering complete tool and die design training—Acme graduates step right into responsible, high-paying positions. NOW you can take the same course taught in our resident schools by CORRESPONDENCE in your spare time. Training made sure and easy through our famous Cope System. If you can finish high school, you can master this profession! Prepare for a career in an \$8000-\$15000 yearly salary bracket—write today to ACME SCHOOL OF DIE DESIGN, Corres. Div. MM, 8 N. Jefferson Street, Dayton 2, Ohio. Approved under PLSSO for Korean Veterans training.

For more data circle 673 on Reader Service Card

March, 1956

**Cut Costs on Hole-Cutting!
USE THE
NEW . . . BOREMASTER**

Finished holes
1½" to 11¾"
diameter to a
depth of 8" on
your present
equipment!



BOREMASTER is not just another Trepanning Cutter, but a real heavy duty tool. Stock is removed in one piece eliminating waste. Remember . . .

TIME SAVINGS + MATERIAL SAVINGS
= COST SAVINGS

- Write us today for complete details!
- See us at ASTE Booth 162

KARL A. NEISE

404 4th Ave., Dept. MMS, New York 16, N.Y.

For more data circle 674 on Reader Service Card

**CHECK YOUR BENDING
PROBLEMS HERE:**

These are representative of the 101 different bends you can quickly set up with a

- | | |
|---|--|
| <input type="checkbox"/> Pipe | <input type="checkbox"/> Rings, Coils |
| <input type="checkbox"/> 90° Bonds on Heavywall or Standard Pipe | <input type="checkbox"/> Centering Large Diameter Eyes |
| <input type="checkbox"/> Steel Tubing | <input type="checkbox"/> Sharp, Square Bends on Flat Stock |
| <input type="checkbox"/> "U" Shapes, "U" Bolts, Square Cornered "U" Bolts, Clevises, Hooks, Links | <input type="checkbox"/> Flat Eyes, Automobile Spring Eyes |
| <input type="checkbox"/> Angles, Offsets, Square Bends, Irregular Shapes on Flat Stock | <input type="checkbox"/> Angle Iron Flange In or Out |
| <input type="checkbox"/> Eye Bolts, "S" Shapes, Round or Square Stock | <input type="checkbox"/> Flat Stock Edgeways |

Get The Facts!

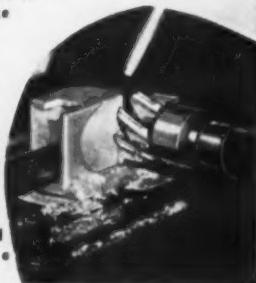
Write for bulletin showing bender models, standard and special dies, and illustrations of bends.

The Hossfeld Universal Iron Bender is indispensable for maintenance and production work in metalworking, custom welding and repair shops, industrial and engineering plants, institutions and vocational departments in colleges, universities, trade and high schools. It replaces special bending equipment. A Hydraulic Attachment (optional) enables one man to bend heavier material.

HOSSFELD MFG. CO.

402 W. 3rd Street

DoAll Stocks All Styles of Milling Cutters, but only one kind . . . the FINEST!



DoALL Carbide Tipped END MILLS

The Finest You Can Use

- Diamond ground cutting edges make perfect cuts.
- Hardened and ground shanks—burrs and nicks eliminated.
- Lapped centers—regrind with accuracy.
- Polished ground flutes reduce clogging.

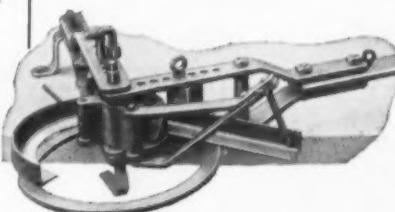
31

For more data circle 675 on Reader Service Card

HOSSFELD

UNIVERSAL®

IRON BENDER



For more data circle 676 on Reader Service Card

ASTE Exposition . . .

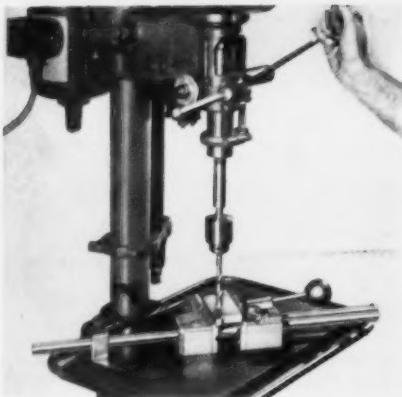
Ill., will display its complete line of "Supream" Chucking Reamers which are available in decimal sizes by every 0.001 inch step from 0.030 up through 0.505 inch. All flutes are ground on face and back after heat treatment for unusually smooth reaming, preventing clogging or freezing of chips. All diameters are held to plus 0.0002 inch and minus 0.0000 for close sizing. Size or special tool markings are stamped halfway on the shanks so as not to become obliterated by chucks. The "Supream" reamers are available in four different set numbers and sizes.

For more data circle 88 on Reader Service Card



VISES AND FIXTURE BASE

Heinrich Tools, Inc., Dept. M-115, Racine, Wis., will feature the following new tools in Booth No. 788: No.



Heinrich No. 13WH Safety Drill Press Vise

13WH Safety Drill Press Vise; No. 12WH Band Saw Vise; Model 22 Self Centering Air Vise; and the "Grip-Master" Fixture Base used in building low cost jigs and fixtures. All the new tools except the Model 22 Self-Centering Air Vise, feature the "Circle-Grip" locking mechanism which is designed to

INSPECTORS' STAMPS for indenting or acid-etching



Booth 662
A.S.T.E. Show

"Safe-Hed" Steel
Stamps

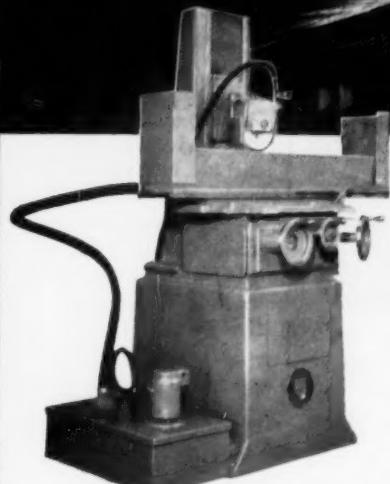
Acid-Etching
Stamps

Now available from stock, your choice of Steel Stamps for indenting, or Vinyl Plastic Stamps for acid-etching. Furnished in many sizes, in letters, figures, or confidential symbols. Any style border or special design made to order. For complete data and charts of inspection symbols, write for Cat. Page 146-A25 and Bulletin "S".

JAS. H. MATTHEWS & CO.
3944 Forbes St. Pittsburgh 13, Pa.

For more data circle 677 on Reader Service Card

REID sets the standard for precision surface grinding...



MODEL 618H convenient finger-tip level controls for all operations make this grinder the favorite of the toolroom for the finest tool and die grinding. Accessories, including Cool-Grind or wet grinding attachments, magnetic chucks and form dressers give extreme versatility for all operations.

MODEL 618VL designed for precision grinding to the finest tolerances with superior surface finish . . . rugged construction and painstaking finishing give true dependability for continuous operation with minimum maintenance. Features power feed table with traverse speed variable from 12 to 35 feet per minute.

*Photo courtesy
Robertson Mfg. Co.*

SPECIFICATIONS

CAPACITY: 6" wide, 18" long, 17 $\frac{1}{4}$ " high from spindle center to table.

WORKTABLE: 51" x 8" overall.

FEED RANGE: Elevating hand wheel (r.) graduated to .0005" (optional, vernier to .0001"); cross feed to .001"; power cross feed adjustable .006" to .100" at either or both ends of table reverse.

GRINDING HEAD: with 3" opening for standard 1 h.p. cartridge type motorized spindle. Wheel size: 7" x 1/2" x 1 $\frac{1}{4}$ ".

FLOOR SPACE: 71" x 43 $\frac{1}{2}$ ".

WEIGHT: 2100 lbs. net.

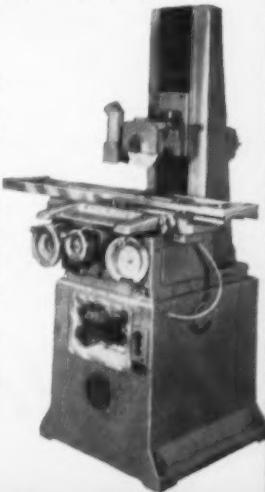
Write for Bulletin 618-12

Reid Brothers Company, Inc.

BEVERLY



MASSACHUSETTS



ASTE Exposition . . .

provide instant setting and positive locking. The Model 22 Self-Centering Air Vise is designed for holding parts varying in size or shape when the work requires the location of a center or other predetermined point.

Other tools to be displayed include "Grip-Master" Drill Press Vises and Fixture Locks; air vises and clamp;

camlock vise; and hand nibs for shearing, nibbling, punching and rod parting operations.

For more data circle 89 on Reader Service Card

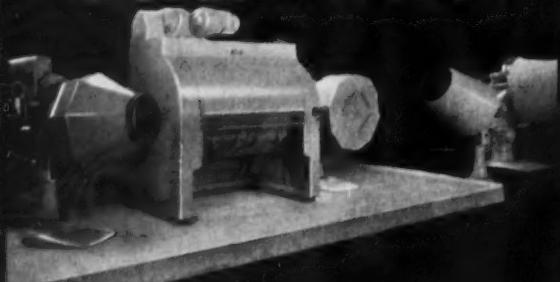
★ ★ ★

TOOLS FOR AUTOMATIC SCREW MACHINES AND TURRET LATHES

R and L Tools, 1825 Bristol St., Philadelphia 40, Pa., will exhibit its complete line of tools for automatic

screw machines and turret lathes in Booth No. 741. These tools will be displayed actually performing the work for which they were designed on an automatic screw machine. The R and L line consists of a turning tool; carbide and roller backrests; releasing and non-releasing tap and die holders; releasing die holder for acorn dies;

PERFORMANCE GUARANTEED!



Got a knotty finishing problem? Then consult our experimental finishing department. We'll untangle it! And we'll analyze the best equipment and abrasive material for the job.

Today . . . before you invest in any finishing equipment . . . send us sample parts, a finished part for use as a guide and your specifications. We'll carry on from there. *We guarantee the same results in your plant as we get in our lab — so how can you lose?* Mail the parts and let's get started.

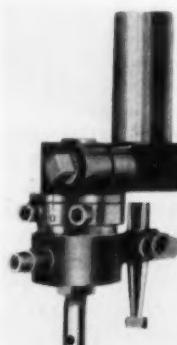


BARREL FINISHING EQUIPMENT

Division CASALBI COMPANY

543 Wayne Street • JACKSON, MICHIGAN

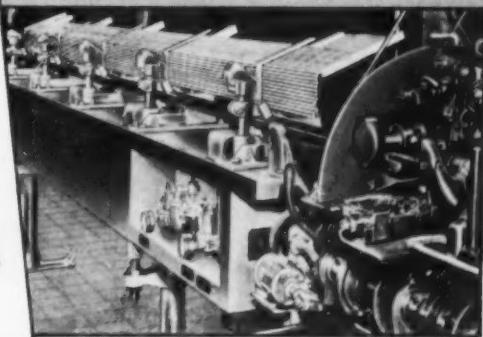
For more data circle 679 on Reader Service Card



R & L Recessing Tool

Now... A Screw-Machine-Feed that BREAKS THE TIME BARRIER!

Steps Up
PRODUCTION
to the
Continuous Flow
of the
FOURTH DIMENSION:
TIME



Every time a screw machine cuts air . . . every time feed fingers are adjusted or replaced . . . every time remnant removal forces a shut-down—that's *time lost forever, never again to be made up in the production quota!*

In the modern Lipe Automatic Magazine-Loading Bar Feed, we present a continuous-feed mechanism that utilizes **EVERY MINUTE** of the working day for production . . . and still more production.

There's **NO** cutting air. **NO** feed fingers. **NO** remnant problem. **NO** minimum or maximum run. **NO** limit on length of feed. **NO** selective stock length requirement.

There **IS** a definite increase in production—up to 100% on some installations—**AT LEAST 30% ON EVERY ONE!**



SEND TODAY for free folder giving full details on Lipe's AML Bar Feed—today's big advance in screw machine stock feeding.



Lipe - ROLLWAY CORPORATION

Manufacturers of Automotive Clutches and Machine Tools
• Syracuse 1, N.Y.

ASTE Exposition . . .

universal tool post; cut-off blade holder; turret backrest holder; recessing tool; revolving stock stop; floating drill holder and knurling tool.

Of these tools, the recessing tool is the newest addition. This tool is available in three standard sizes of $\frac{5}{8}$, $\frac{3}{4}$,

and 1 inch shanks and it can be adjusted to operate on any internal diameter within capacity of machine. It is also adjustable to operate on outside diameter for cutting grooves, chamfering, cutting clearance at end of threads, and so on. The tool may be operated with spindle running right or left.

For more data circle 90 on Reader Service Card



FLOOR AND SURFACE PLATE EQUIPMENT

In Booth No. 941, The Challenge Machinery Co., Grand Haven, Mich., will exhibit floor and surface plate equipment made from a new type of black granite which is claimed to be harder and denser. Other precision equipment to be displayed includes cast-iron top work benches, T-slotted welding tables, semi-steel checking tables with arc-welded stands, lapping plates, hand-scraped or precision-ground straightedges and angle plates, box parallels and V-blocks for toolroom operations.

For more data circle 91 on Reader Service Card



PRESS BRAKE AND PROFILE BENDING MACHINE

A new 12-ton hydraulically-operated press brake with a 48-inch length of bed and ram and a profile bending ma-

COLLET EQUIPMENT

Use-Em-Up Type Drill Sleeves
Use-Em-Up Type Drill Sockets
Standard Type Drill Sleeves
Standard Type Drill Sockets
Short Shank Type Sleeves
Short Shank Type Sockets
B. & S. Taper to B. & S. Taper Sleeves
B. & S. Taper to Standard Taper Sleeves
Standard Taper to B. & S. Taper Sleeves
Rough Shank Sockets
Solid Type Sockets
Morse Taper Shank Tap Sockets
Standard Spot Facing Cutter Bars
High Speed Point Lathe Centers
Carbon Steel Lathe Centers
Pipe Centers for Lathes
Lathe Bushings
Blank End Arbors
Chuck Arbors
Drill Drifts
Magic Type Chucks and Collets

Standard tools for all drilling, reaming, and tapping needs and special tools to order. Immediate attention to regular or special requirements.

THE COLLIS COMPANY
CLINTON, IOWA

Dept. A

For more data circle 681 on Reader Service Card

376 modern machine shop

HARGRAVE CLAMPS

A Complete Line of Clamps for all Purposes

Individually
Power Tested
for Better
Performance



No. 540
Made in openings
from $\frac{1}{4}$ " to 12".
Widths from $\frac{1}{2}$ " to
16". Economical.

WRITE FOR CATALOG No. 65.

Showing Clamps, Chisels, Funches, Masonry Drills for hand and power hammers, Carbide Drills, Washer Cutters, and File Cleaners.
Stocked by Your Local Distributor.

THE CINCINNATI TOOL COMPANY
1947 Waverly Ave., Cincinnati 12, Ohio

For more data circle 682 on Reader Service Card

March, 1956

MODERN builds

MACHINING
METHODS

MODERN builds

for

POROSITY
CHECKING

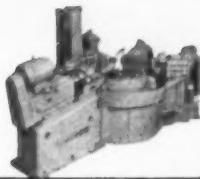
MODERN builds

for

DEBURRING

Special Machines

like this 5-way machine for
drilling and tapping jet
engine compressor housings.



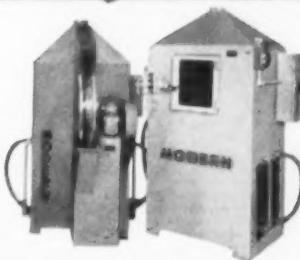
Pressure Testing

equipment like these models
which check exhaust mani-
folds for leaks. They also
locate the leak for salvage.



Malzo Blast

deburring machines like
these for the production bur-
ring of "soft" metal parts.



and only

MODERN builds the
Burr-Masters
for

GEAR DEBURRING AND CHAMFERING

Shown here is the model BME-14 Universal Burr-Master. It
chamfers and deburrs the teeth of spur and helical gears as
well as external straight or involute form splines. Universal
Burr-Masters are available to handle pitch diameters from
 $\frac{1}{8}$ " to 24".



MODERN

Industrial Engineering Co.

14230 BIRWOOD AVE. DETROIT 38, MICHIGAN

For more data circle 683 on Reader Service Card

THE ANSWER
to some difficult
RIVETING
PROBLEMS

For Example:



The long pin in this hinge assembly is $\frac{1}{8}$ " x $2\frac{1}{8}$ " and was being distorted and excessively peined. On the HILL RIVETER, with controlled time cycle and adjustable impact, a perfect job is done every time in 2 seconds at 15 psi.

This air-operated riveting machine produces accurately controllable results that cannot be obtained on ordinary machines. For regular solid riveting, it is unbeatable; for difficult problems, it is *The Answer*.

**THE HILL
PNEUMATIC
RIVETING
MACHINE**

Essentially, the machine consists of a revolving, air operated, reciprocating hammer, working against an anvil which is adjustable in a rigid bracket. For all details, and complete specifications, write for free bulletin: "High Speed Production Riveting."

HILL MACHINE COMPANY

1301 EDDY AVE., ROCKFORD, ILLINOIS

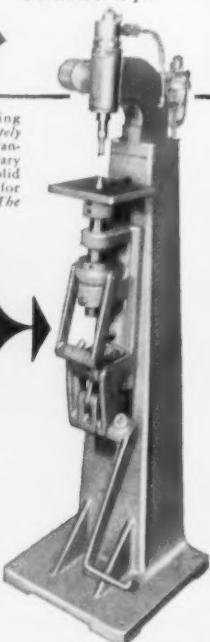
For more data circle 684 on Reader Service Card

378 modern machine shop

ASTE Exposition . . .

chine will be displayed for the first time in Booth No. 1000 by O'Neil-Irwin Mfg. Co., 306 Eighth Ave., Lake City, Minn. Designated as the Model No. 18-48, the most important feature of the new Di-Acro Power Press Brake is "Stroke Control." This means that the most practical length of stroke for each job can be preset. The shorter the length of stroke, the greater the production efficiency, and the more safety to the operator.

The profile bending machine has a special pneumatic floating nose and is equipped to demonstrate scroll and contour forming. Bending can be accomplished in either direction. During a forming cycle, the floating nose advances or contracts as the contour shaped forming block revolves on the bending spindle. Special equipment on the profile bender is a four-way valve, muffler, air cylinder, filter-regulator,

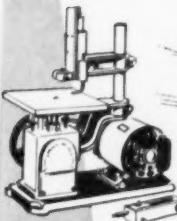


Di-Acro Model 18-48 Power Press Brake

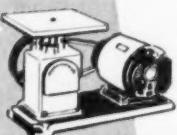
March, 1956

the NEW

KELLER Die Filers



DELUXE: Files,
Saws, Laps. Has
File Roller Support
Arm and Overarm.



ECONOMY: Has
no File Roller
Support Arm or
Overarm.



Standard: With File
Roller Support Arm
for Maximum Accuracy

Saves Time, Saves Money, and Does the Job Better!

Built-for-the-Job . . . Handles all shapes and sizes of files from $\frac{1}{8}$ " diam. to $\frac{1}{2}$ " x $\frac{3}{8}$ ". File Roller Support has full 6-inch adjustment for Maximum Accuracy on every job.

Large $8\frac{1}{2}$ " x $8\frac{1}{2}$ " Worktable with plenty of room for clamping guide blocks, etc. Table tilts up-to 15-degrees in any direction and is locked by four knurled thumbscrews.

Long, Dependable Service . . . the Scotch Yoke is splash lubricated and equipped with Ollite Bearings throughout.

Plenty of Power— $\frac{1}{4}$ H.P. 1800 rpm motor.

Write for Bulletin 256, and your distributor's name.

SALES SERVICE MACHINE TOOL CO.

2355 University Ave.

St. Paul 14, Minn.



ACCESSORIES: Steel
Floor Stand, Hinged
Belt Guard, and
Gooseneck Lamp.

KELLER *Power* Die Filers

For more data circle 685 on Reader Service Card

Built by
the makers of
KELLER
Power Hack Saws

ASTE Exposition . . .

lubricator and shock tank. This same bender can also be converted into a bar or tube bender by changing the tooling on the machine.

Other Di-Acro precision metalworking machines to be displayed and demonstrated include Di-Acro brakes, rollers, shears, punch presses, notchers,

*Look into the complete, cost-cutting LOVEJOY line.
Standard tools are in stock — to help you
increase production, save time and money now!*



INSERTED-TOOTH MILLING CUTTERS

Face, side, end, slotting and boring mills.

H. S. S., CARBIDE, ALLOY BLADES

Interchangeable in all Type "A" milling cutters from $4\frac{1}{2}$ " to 24" in diameter.

NEW! SET-SCREW TYPE END MILLS

And new Type "Z" slotting cutters provide maximum axial and radial adjustment.

Boring Tools · Arbors · Flywheels
Lovejoy Milling Cutter · Assembly Gage

Special cutters are a Lovejoy specialty

Write for new catalogs: No. 31 (Face Mills),
No. 32 (Side Mills), No. 33 (Arbors).

130 MAIN ST., SPRINGFIELD, VERMONT

See them
at the show!

BOOTH NO. 184
A.S.T.E. SHOW

LOVEJOY
TOOL COMPANY, INC. *Ltc*
SPRINGFIELD, VERMONT, U.S.A.

For more data circle 686 on Reader Service Card

380 modern machine shop

rod parters and spring winders. Engineers will be on hand to demonstrate all machines.

For more data circle 92 on Reader Service Card

★ ★ ★

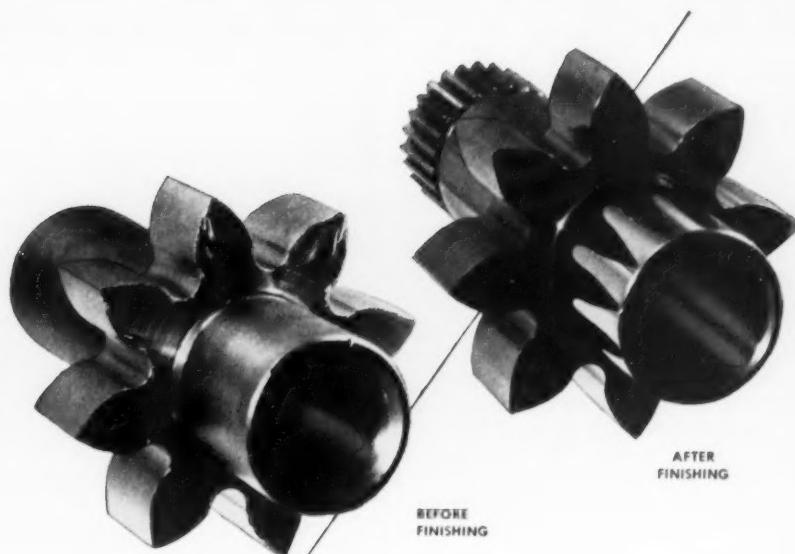
AUTOMATIC PRODUCTION SAWING

Unusual machining techniques and a new service in gages will be presented in Booth No. 1520 by The Do-All Co., 254 N. Laurel Ave., Des Plaines, Ill. The Demon Saw Band, combining the hardness of high speed steel with the flexibility needed for band sawing, will be featured.

The Do-All Power Saw will perform rapid automatic cut-off operations with the Demon blade. Interesting corollaries to the cut-off operation will be automatic indexing of stock on the power saw and the "robot-like" operation of automatic features, such as automatic feed pressure control, automatic band tensioning and infinitely variable tool speed control.

Completely automatic angle sawing of stacked bar stock will be featured on a Do-

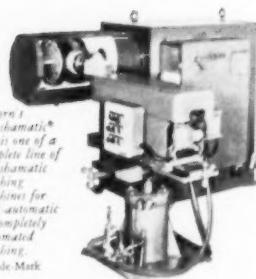
March, 1956



Finished to run without a...
drop of oil

Osborn I
Brushmatic®
SA is one of a
complete line of
Brushmatic
finishing
machines for
semi-automatic
or completely
automated
finishing.

*Trade Mark



Visit Our Booth 446
INDUSTRIAL EXPOSITION
INTERNATIONAL AMPHITHEATRE
CHICAGO MARCH 19-23, 1958

OSBORN

BRUSHING METHODS • POWER, PAINT AND MAINTENANCE BRUSHES
BRUSHING MACHINES • FOUNDRY MOLDING MACHINES

For more data circle 687 on Reader Service Card

March, 1958

modern machine shop 381

Osborn Brushes

MORE precise finishing of parts is vital to the continuing improvements in jet aircraft components. Fuel pump gears, shown above, are an example.

Unlike the original oily, kerosene-type fuels, today's jet fuel has extremely low lubricating quality. Brushing to remove burrs—blend surfaces and edges of teeth—is an important early step in producing the micro-finish that permits fuel pump gears to run at speeds to 3500 rpm, under pressures to 900 psi... without lubrication. Higher finishes are also reducing torque, greatly increasing equipment service life.

An **Osborn Brushing Analysis** can point out ways to improve your finishing operations. Ask about it today. Write *The Osborn Manufacturing Company, Dept. B-3, 3461 Hamilton Avenue, Cleveland 14, Ohio.*

ASTE Exposition . . .

All 16-3 Contour-matic Band machine. High production machining using the simple fast loading fixtures will be conducted on a Model 26-3 Contour-matic Band Machine. Demonstrations will show how various operations can be performed rapidly on the semi-automatic band machine using Demon high speed steel saw blades.

Reliability of surface grinder controls reflected in the ability to remove exactly corresponding amounts of material will be proved in a demonstration of a DoAll Surface Grinder. This machine will be arranged for automatic downfeed, a standard feature.

An outstanding "first" soon to be announced will be presented. Called the "Microtomatic" Precision Slicing Machine, it offers a practical method and complete facilities for parting and slicing

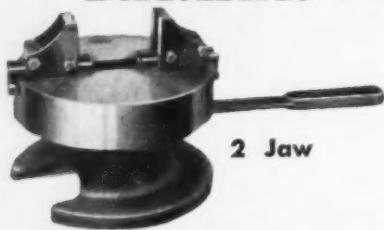


DoAll Power Saw with Demon Saw Band

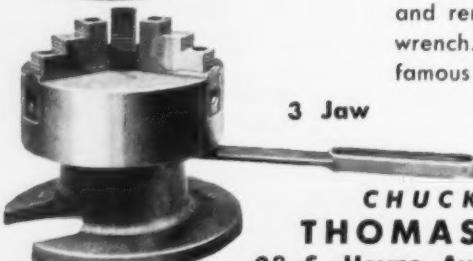
ing extremely brittle, crystalline materials, such as germanium and silicon.

Two valuable gaging services will be announced at the show. First is the of-

use BARKER DRILL PRESS VISES--



2 Jaw



3 Jaw

for low-cost, faster production in such operations as facing, tapping, reaming, drilling, milling, countersinking, counterboring and molding work on assembly operations. Operated by an easy and simple movement of a lever—the work is set and removed without the use of a wrench. Similar in design to the famous Barker Wrenchless Chuck.

Write for bulletin 201 today

CHUCK DIVISION
THOMAS HOIST CO.
28 S. Hoyne Ave. Chicago 12, Ill.

For more data circle 688 on Reader Service Card

The Basic Idea back of
Bridgeport
TURRET MILLING MACHINES
*was conceived, created, developed
 and made universally practical by*
BRIDGEPORT ENGINEERS

Universal acceptance of Bridgeport Millers has established beyond the shadow of a doubt that the basic principle in these machines is **RIGHT**. It also means that there was a definite need for a machine of this type to replace other machines which had outlived their usefulness. It means, too, that Bridgeport Turret Milling Machines can be installed in any shop for tool room or production line without radically upsetting procedures which have been in conventional use.

BRIDGEPORT MILLERS have met existing conditions universally. Careful planning in Bridgeport's own new shop has made it possible to offer exclusive advantages at a maintained reasonable price, a fact which indicates that their designers and manufacturers have made an outstanding contribution to modern metal working progress.

Investigation of Bridgeport Milling Machines and their many attachments is always in order.



CHERRYING ATTACHMENT
 Makes possible production of convex and concave shapes.
 Ideal for producing drop forge dies, molds, cavities.



TRUE TRACE COMBINATION
 The Bridgeport True Trace Combination will give excellent performance and save endless hours when copying irregular dies and molds.



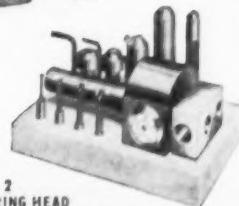
RIGHT ANGLE ATTACHMENTS



(Left) Heavy Duty . . .
 for milling and drilling at right angles; fits both Master and 1 HP Bridgeport Heads.



(Right) Light Duty . . .
 for right angle milling and drilling narrow, deep molds and cavities.



No. 2 BORING HEAD
 Boring Tools and Holder provide means for boring holes up to 6" diameter; available for use on Bridgeport 1 HP Milling, Drilling and Boring Attachment.

***Bridgeport* MACHINES, INC.**

Manufacturers of High Speed Milling Attachments and Turret Milling Machines

For more data circle 689 on Reader Service Card

ASTE Exposition . . .

fer of a free certificate of inspection, that is a calibration report, to be given with each set of DoAll "A" grade or better gage blocks. The second gaging service will be a new plan to help industrial plants establish their own "bureau of standards."

In addition to a complete line of measuring tools, the company will feature its "Micro-Step" gaging system and the Square Block Gaging Accessories for assembling rectangular or square blocks into working gages of every size and description. DoAll granite surface plates and Bausch & Lomb optical comparators, distributed by DoAll, will occupy part of the gaging display. The complete range of DoAll cutting tools, tool steel and other industrial supplies will also be displayed. The exhibit will include the "ground-from-the-

solid" XL brand drills and a special oil drill over 4 feet long and 2½ inches in diameter. Combined drills and countersinks will also be shown.

For more data circle 93 on Reader Service Card

★ ★ ★

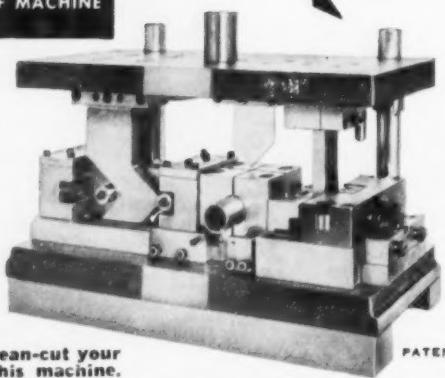
PIN-MOUNTED TWO-PIECE CORE DRILL

In Booth No. 1143, Metal Cutting Tools, Inc., 301 S. Water St., Rockford, Ill., will introduce a new pin-mounted two-piece type core drill incorporating a number of new advanced features to assure efficient cutting action and long, trouble-free service. The new tool consists of a drill body and either a high-speed or carbide tipped replaceable cutter. The replaceable cutter is secured to the body of the drill by means of a simple Allen head cap screw, and is accurately positioned and driven by means of four pins located in the cen-

Cuts Tubing to Accurate Lengths in SPLIT SECOND TIME!

- LENGTHS of $\frac{1}{2}$ inch or more are accurately cut to $\pm .010"$ with each stroke of press—actually less than $\frac{1}{2}$ of a second or faster than any other known method.
- In addition to being rapid and precise, the Vogel Cut-Off also cuts clean with a minimum of burr and distortion. Many thousands of cuts can be made before shear blades require sharpening.
- Unit No. 12 accommodates tubing up to $\frac{1}{2}"$ O.D. with $\frac{3}{32}"$ wall; the No. 2 takes tubing up to $2"$ O.D. with $\frac{1}{8}"$ wall.
- Ask for sample showing how clean-cut your tubing can be sheared with this machine.

VOGEL TUBE
CUT-OFF MACHINE



VOGEL

TOOL AND DIE CORPORATION

1823 NORTH 32nd AVENUE, MELROSE PARK, ILLINOIS

For more data circle 690 on Reader Service Card



GILBERT

add reverse curves to your machining pitch

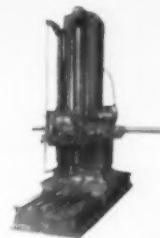
"The Gilbert revolving column boring mills, together with the very accurate Goodrich follower, make possible the machining of deep cavity, steep side dies complete in one position of the work piece.

"It is also possible to machine cupped ends or reverse curves without having to move the job."

These are the words of Mr. Ed Miller, President of the Lansing Tool & Die Company, Lansing, Mich. With his two Cincinnati Gilbert Floor Type boring

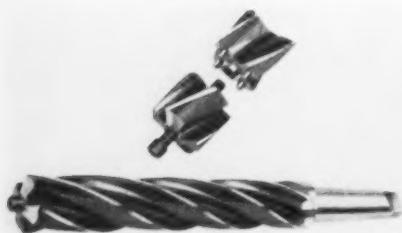
mills, he has offered customers machining services which couldn't be done on any other horizontal mills. Other equipment capable of doing these jobs costs several times more than the Gilberts.

For profiling and duplicating, a Gilbert offers you quick profits on a low investment. Bulletin 954 contains full descriptions and specifications. Write for it today. *The Cincinnati Gilbert Machine Tool Co., 3366 Beekman St., Cincinnati 23, Ohio.*



those who buy Gilbert buy **GILBERT** *again*

ASTE Exposition . . .



Metcut Pin-Mounted Two-Piece Core Drill

ter of each flute. The new pin-mount design permits easy hand removal of the cutter, eliminates the objectionable gap between the body of the tool and the cutter section and provides maximum chip flow capacity.

It is especially important to note that the new pin-mount design now permits supplying these tools in small sizes.

Sizes ranging as low as $\frac{3}{4}$ inch can be provided and profitably applied to a variety of production work.

For more data circle 94 on Reader Service Card

★ ★ ★

DRILL HEADS, BROACHING MACHINES, FIXTURES AND SPECIAL TOOLS

In Booth No. 179, Zagar Tool Inc., 23898 Lakeland Blvd., Cleveland 23, Ohio, will exhibit the following standard equipment: gearless multiple-spindle drill heads of varying sizes and drill patterns; standard broaching machine, both horizontal and vertical; collets, collet pads, and collet blanks; indexing fixtures and collet lathe chucks; holding fixtures, manually and air-operated; and displays and information of special tools and tooling for machining. In addition, cam drill units with sole mechanical operation in four sizes



SPECIAL MILLING CUTTERS

PLAIN STYLE • ANGULAR • FORMED
CONCAVE • CONVEX
STAGGER TOOTH • SIDE MILLING

Prompt Quotations, Competitive Prices

Agents' and Jobbers' Inquiries Welcome

QUALITY TOOL WORKS

792 S. MARKET ST. • WAUKEGAN, ILL.

For more data circle 692 on Reader Service Card

Extra Capacity with **hall** COLLET CHUCKS

for
SPEED,
ACCURACY,
ECONOMY

Automatic adjustment speeds up production in multiple operations with push-out type HALL COLLET CHUCKS. Full spindle capacity or over.

Tremendous grip over or under stock size.

Without adjustments. Shortest overhang. All grip

... no slip. No bearings... no heat or lost power. Instant release without stopping lathe.

SATISFACTION GUARANTEED!

Made in Three Sizes to Fit Your Requirements:

Model A ... 1" (max. capacity 1-1/16")

Model B ... 2" (max. capacity 2-1/16")

Model C ... 3" (max. capacity 3-1/4")

Write today for illustrated catalog and price list—Dept. B-3.

HALL MANUFACTURING COMPANY

622 TULARES DRIVE, LOS ANGELES 26, CALIFORNIA

For more data circle 693 on Reader Service Card

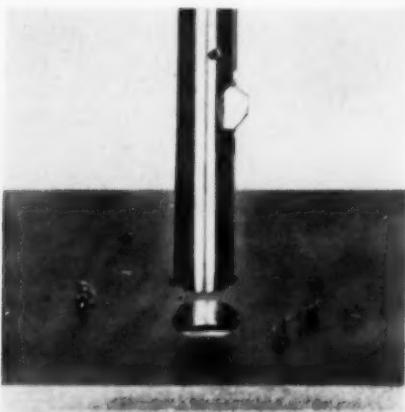
will be exhibited. Various types of drives will be demonstrated, and capacities from $\frac{3}{8}$ through 2 inches in diameter can be accommodated. An air-oil feed drill press, for multiple hole drilling in one operation, will be presented. The drill press is completely self-contained and has hydraulic power feed and air control. Shown for the first time will be the newly developed Zagar head for the drilling of printed circuit boards.

For more data circle 95 on Reader Service Card

★ ★ ★

HOLE DEBURRING TOOLS

The "Burr-Away," a hole deburring tool which functions as well on lower as on upper surfaces, will be the feature exhibit of Cogsdill Tool Products, Inc., Oak Park (Detroit), Mich, in Booth No. 185. The tool, stocked in sizes from $\frac{1}{8}$ to 1 inch in diameter, consists of a high-tensile stress-resisting steel rod, rifle-bored and tapped from one end and slotted near the other, with a high-speed steel cutter blade in the slot and hinged on a pin which passes through the slot. The cutter, turning at approximately 50 to 75 s.f.p.m. (de-



Cogsdill "BurrAway" Deburring Tool in use

March, 1956

QUALITY AT LOW COST

QUEEN CITY HEAVY DUTY
GRINDERS
DISC GRINDERS
AND BUFFERS



QUEEN CITY Heavy Duty Disc Grinders and Buffers save you money when you buy and during every hour of use. Ruggedly designed, they feature special heavy duty bearings and motors. So good they're offered on a 30-day trial, yet priced 20 to 30% under competing makes.

Choose from the complete range of QUEEN CITY Grinders and Buffers . . . floor and bench types . . . in sizes from $\frac{1}{2}$ to 10 H.P.

QUEEN CITY
MACHINE TOOL CO.

WRITE FOR FREE
CATALOG TODAY!

QUEEN CITY
MACHINE TOOL CO.

3911 Kellogg Ave., Cincinnati 26, Ohio

"High Quality—Low Cost—For Over 50 Years"
For more data circle 694 on Reader Service Card

ASTE Exposition . . .

pending on the material), works against adjustable pressure from a push rod located inside the tool and backed by a spring under compression. As the tool is passed through a hole, the blade first cuts, collapses, then cuts again on the return stroke, efficiently and automatically removing burrs both on top and underneath without turning the

work. The BurrAway will be performing actual production deburring operations during the show.

For more data circle 96 on Reader Service Card

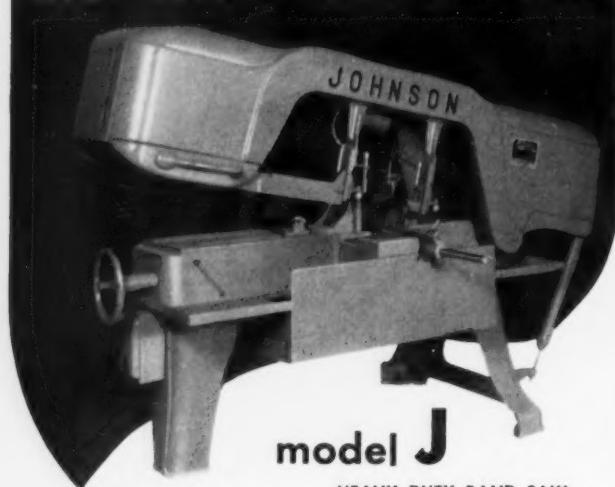
★ ★ ★

FLAME-PLATING

In Booth No. 931, Linde Air Products Co., Division of Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y., will present the Flame-Plating story.

Flame-Plating is a process developed by Linde for coating selected areas of parts and tools with tungsten carbide for extreme resistance to wear. The particles of tungsten carbide are literally blasted onto almost any base metal. Because the temperature of the part being plated seldom exceeds 400 degrees F., there is little chance that the base metal will warp or that its metallurgical properties will be changed. In this way, selected areas of most any part or tool can be made extremely resistant to wear, and other advantages, such as lightness or easy machinability, can be

BIG • FAST • ECONOMICAL



model J

HEAVY DUTY BAND SAW
(WET OR DRY)

FEATURES

- Large Capacity
- Semi-Portability
- Versatility
- 3-point Suspension
- Operational Safety
- Centralized Controls
- Speed—Accuracy
- Lowest Cost

- The finest metal cutting band saw available
- ... and at the lowest price. The big, rugged Johnson Model J easily handles 10" rounds, 18" flats—automatically. A brute for work, the versatile Model J is available in standard wet or dry models. See for yourself how much time, labor and money you can save with a Johnson saw.

Johnson

MANUFACTURING
CORPORATION

- Main Plant—1011 Barnes St.
- Albion, Michigan

For more data circle 695 on Reader Service Card

New KNURLMASTER
Hand Knurler
\$13.50

No distortion — even on $\frac{1}{8}$ " stock!
MODEL "C"

For small production runs on $\frac{1}{8}$ " to 1" stock. Exclusive screw design gives perfect knurl pattern. Furnished with 3 hardened knurls of standard $\frac{1}{2}$ " dia. Forged steel frame is self-centering. Write for illustrated folder.

Dealers Inquiries Invited

ROCKWIN MANUFACTURING CO.

45 Rose Street

New York 38, N. Y.

For more data circle 696 on Reader Service Card

EASY PUMPS for TOUGHER JOBS

DESIGNERS
AND MANUFACTURERS OF
52 TYPES OF PORTABLE
PUMPS AND COOLANT
SYSTEMS FOR LUBRICATION
AND MACHINE
TOOLS.

Capacities: 2 thru 50 gpm.
Tank Sizes: 3½ thru 35
gals. Motor Sizes: 1/30 thru 1/2
h.p. Single phase, 3 phase and
Totally Enclosed Motors.

No Metal to Metal Contacts and
No Bearings.

Vertical
pumps
available.



EASY INDUSTRIES

214 N. RACINE

CHICAGO 7, ILL.

Dealer Inquiries Invited

For more data circle 697 on Reader Service Card

March, 1956

Cut Costs!
with the *Veet*
**3 Ft. PRECISION
RADIAL DRILL**
with
**FLAME HARDENED
COLUMN**

GUARANTEED
for 1 year against
defective parts or any
mechanical defects.

\$2950.00
F.O.B.
DETROIT

**PRICED AS LOW AS
AN UPRIGHT DRILL!**

Send for our new brochure describing the 16 points of superiority of the VEET Precision Radial Drill.

MANUFACTURED BY

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TELEPHONE Prescott 6-3000
23751 GROESBECK HIGHWAY EAST DETROIT, MICH.

For more data circle 698 on Reader Service Card

ASTE Exposition . . .

easily obtained. As Flame-Plating is a service, the display will include a selection of products of other manufacturers which have been coated with tungsten carbide by Linde. In order to interest each of the various types of engineers who will be present, the ex-

hibit will be sub-divided under the following headings; Machine Tool Parts; Seals and Bushings; Industrial Cutting Knives; Industrial Gages; and Screw Machine Parts.

For more data circle 97 on Reader Service Card

★ ★ ★

ROTARY SWAGING MACHINES

The Torrington Co., Torrington, Conn., will introduce a completely new line of rotary swaging machines in Booth No. 219. The new machines are styled for the requirements of modern industry and designed for better operating efficiency. The new swager is said to offer greater capacity in each general size range. Bench models can be furnished with a base of modern design, which contains storage space for spare parts and dies. New advances have also been made in improved noise control, and provisions for a variety of feed attachments.

For more data circle 98 on Reader Service Card

★ ★ ★

AIR AND HYDRAULIC CYLINDERS

In Booth No. 324, Rivett Lathe & Grinder, Inc., Brighton 35, Boston, Mass., will introduce a new line of low pressure cylinders which is suitable for 150 p.s.i. air service and/or 500 p.s.i. hydraulic operation. The cylinder meets J.I.C. specifications in every re-

REMOVES AND FILTERS COOLANT FROM MACHINE SUMPS

The Model 20T Series NA is just one of five Carnes portable sump cleaners. Each is engineered for a specific cleaning job from cleaning a bank of machine tools in a short time to handling highly abrasive coolant. Capacities from 55 to 200 gallons.



Write for
literature
and
details to:

**COOLANT EQUIPMENT
CORPORATION**

VERONA

WISCONSIN

For more data circle 700 on Reader Service Card

390 modern machine shop

AT AN ANGLE — IT FILES



USED STRAIGHT — IT FINISHES

the **Reciprofiler** the new "3-WAY" tool

WRITE
FOR
BROCHURE
AND
PRICES
*Pats. Pend.

Nord Corporation

12 SPRUCE STREET
NUTLEY, NEW JERSEY

For more data circle 701 on Reader Service Card

March, 1956

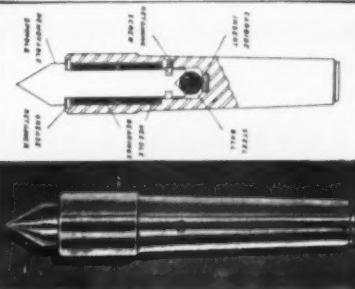
Turning accuracy to .00015 max.

WEE LIVE CENTERS

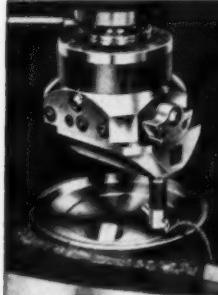
While the Wee is an all purpose center, its SMALL HEAD fits it for special setups as, in swing turrets, grinding operations, small gear cutting, etc. Test one—money back if center does not prove its worth in 24-day trial. No. 2, M.T. \$21.00. No. 3, M.T., \$24.00. Write for complete price list, many sizes, tapers, shanks. Ask for NEW folder.

Write direct, if distributor cannot supply you.

HERBERT CROSS & SON, Bala-Cynwyd 1, Pa.



For more data circle 702 on Reader Service Card



REASONS WHY MODERN ENGINEERS SELECT The Wohlhaupper **MASTERHEAD**

For Precision Work & Most Economical & Automatic Operation

- The **MASTERHEAD** does Boring, Facing, Recessing, Undercutting, Outside Turning, etc.
- It does this in One Operation and on One Machine.
- Automatic Feeds
- Increases the capacity of your present equipment.
- Increases Production, makes Better Finished Work.
- Nine Models available for work up to 36 $\frac{1}{4}$ " diameter.
Also taper cutting heads.

Sole Agent See us at ASTE Booth 162 Send for illustrated literature

KARL A. NEISE, 404 Fourth Ave., Dept. MMS, New York 16, N. Y.

For more data circle 703 on Reader Service Card



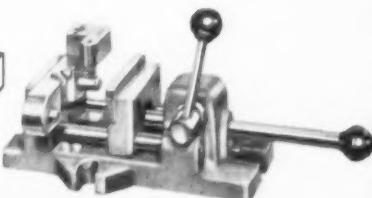
A Simple Formula for Solving Tooling Problems

$$A + B = C$$

No need to start from scratch...use the HEINRICH Grip-Master Jig and Fixture base...

Simply add false jaws and bushing plate.

Result...an accurate, low-cost Drill Jig.



See Us at the ASTE Show—Booth 788

Write for Free Catalog

HEINRICH TOOLS, Inc. Dept. 116-C Racine, Wis.

For more data circle 704 on Reader Service Card

**WE REGRET THAT
WE WILL NOT
DISPLAY THE NEW***
**REGENT
DUPLICATOR
TABLE**
**at the ASTE SHOW
IN CHICAGO...**

**We are too busy
filling your orders!**

*NEW Adjustable Brake for SELECTIVE
SENSITIVITY

*NEW Raceway Design for Even
Smoother Operation

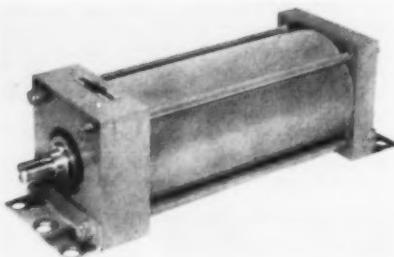
IF you have not investigated how the REGENT TABLE (mounted on your Bridgeport Mill in minutes) can enable you to do those complex profile milling jobs (2 or 3 dimensional) with inexperienced help, write for our latest literature to

J. M. KALINS & COMPANY
115 East Washington Avenue
Bridgeport 8, Connecticut

For more data circle 705 on Reader Service Card

392 modern machine shop

ASTE Exposition . . .



View of Rivett Low Pressure Cylinder

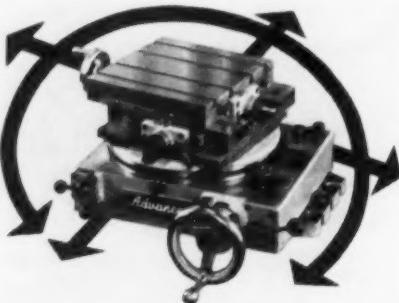
spect and features a square steel cover, tie rod construction. In addition, a new line of hydraulic control valves will be introduced and displayed.

For more data circle 99 on Reader Service Card

★ ★ ★

CROSS SLIDE ROTARY TABLE

In Booth No. 332, Morrison Engineering Co., 941 W. Lake St., Chicago 7, Ill., will feature the Advance Cross Slide Rotary Table, a device designed for fast accurate positioning of work from one location to another. Unclamping, relocating and reclamping is unnecessary with the cross slide rotary table. The sturdy device is made for use



View of Advance Cross Slide Rotary Table

March, 1956

"MILWAUKEE" Straight Edges-

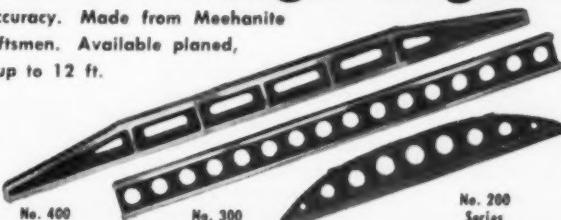
Famous for long-lasting accuracy. Made from Meehanite—fashioned by skilled craftsmen. Available planed, scraped, or ground. Sizes up to 12 ft.

Write for Bulletin

J. C. BUSCH CO.

Engineers & Machinists
Since 1907

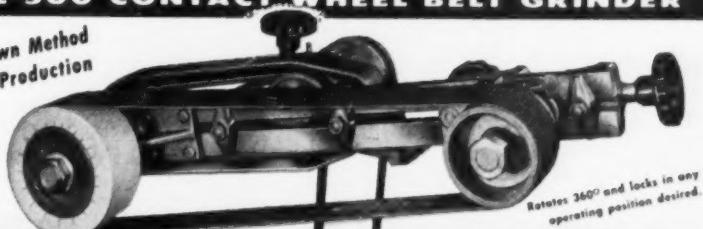
126 E. PITTSBURGH AVE.
MILWAUKEE 4, WIS.



For more data circle 706 on Reader Service Card

MODEL 500 CONTACT WHEEL BELT GRINDER

The Fastest Known Method
of Increasing Production



Rotates 360° and locks in any
operating position desired.

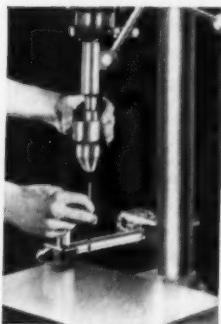
WRITE FOR COMPLETE INFORMATION
ON INCREASING YOUR PRODUCTION

B & E MFG. CO., INC.

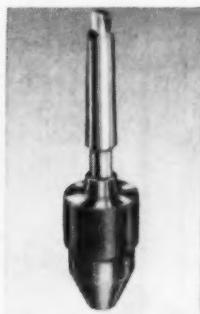
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KANSAS CITY 8, MISSOURI

For more data circle 707 on Reader Service Card

CHANGE TOOLS IN SECONDS, SAFELY!



Spindle never stops. To open—pull down. Jaws open automatically, release tool. To close—insert new tool. It's locked and centered.



Model A—capacities from $\frac{1}{8}$ " to $\frac{3}{8}$ " and $\frac{5}{8}$ " to $\frac{1}{2}$ " available with Nos. 1, 2 and 3 Morse Taper Shanks and Taper Adapters.

Drill, ream, counterbore with one spindle, without stopping spindle or moving work.

No keys, collets or wrenches are needed on Wahlstrom Fully Automatic Chucks and Tapping Attachments. Tool is automatically centered. Grip can't slip or chew tool shank. Wahlstrom Chucks convert 95% of lost tool changing time to productive time. And, a single chuck does work of several spindles. Write for spec. folder and distributor name. Made by the makers of the Float-Lock Industrial Vise.

*See us at Booth 153, ASTE Show



AMF TOOL DIVISION

AMERICAN MACHINE & FOUNDRY COMPANY
224 Glenwood Avenue, Bloomfield, New Jersey

For more data circle 708 on Reader Service Card

ASTE Exposition . . .

on all vertical-type milling machines and is designed to withstand maximum cuts which would ordinarily vibrate the heads of these machines. The Advance Cross Slide Rotary Table is said to be unusually accurate—plus or minus 1 minute on the rotary table and 0.0005 inch on the cross slide.

For more data circle 100 on Reader Service Card

★ ★ ★

POWER TOOLS

Jarvis Corp., Middletown, Conn., will feature several new tools, as well as power tools for industry, in actual operation in Booth No. 1401. Among the tools to be introduced are angle hand pieces, tools which can be easily adapted to power driven units for smooth, easy work in "hard to get at places."

Other tools to be shown for the first time are new Jarvis countersinks which are chatterless and which provide long cutting life on a wide variety of materials. Jarvis flexible shaft machines and equipment using solid tungsten carbide files will be installed in the booth, and deburring operations will be demonstrated. Torqomatics will also be in operation to afford visual evidence of the tapping speed and ease possible with Jarvis taps. Adjustable and fixed spindle multiple units, as well as a complete line of solid tungsten carbide tools, will also be shown.

For more data circle 101 on Reader Service Card

★ ★ ★

VIBRATING PARTS FEEDERS

In Booth No. 631, Syntron Co., Homer City, Pa., will exhibit a number of vibrating parts feeders, each of which will be operating, handling and orient-

WANT MORE EFFICIENT—
LONGER LASTING STEEL STAMPS?
**USE
SAFETY WEDGE GRIP**
LETTERS and FIGURES



• No Spill
• No Backwash
• Marks Sharp
• Keenened Grip
• Patented Design
No. 2,585,794
• Thumb Side Markings

Write for
Bulletin
LF-108

Knurled sides for positive grip — patented design provides perfect balance and deeper impressions. Especially recommended for toughest jobs on steel castings, cylinders, tool steel, etc. All sizes available 1/16" to 1" characters.

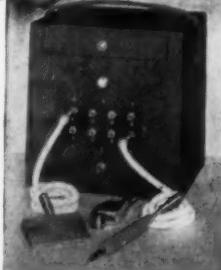
Mecco SAFETY MARKING TOOLS

M.E. CUNNINGHAM CO.

1051 Chateau Street • Pittsburgh 33, Pa.
For more data circle 709 on Reader Service Card

394 modern machine shop

**MARK
IRON,
STEEL
and
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THE Etchograph WAY

Original Electric Etcher, Thousands in Daily Use
Marks hardened parts, tools, dies, gages and fixtures of any ferrous metals including the hardest alloys and carbides — quickly — plainly. Three sizes to meet all requirements.

• Write for circulars and prices.

BREWSTER-SQUIRES CO.

P. O. Box 601 Englewood, N. J.

For more data circle 710 on Reader Service Card

March, 1956

ing a small part. There will also be a display of vibrating parts feeder feeding ball bearings to a gravity feed track. This track will be equipped with an escapement device controlled by a timer so that the ball bearings can be discharged at regular intervals. By means of the timer, the time interval may be changed to either increase or decrease the discharge of the ball bearings. This feeder will be working automatically so that all that is necessary for demonstration is to change the cycle on the timer. Another spectator-operated display will consist of a vibrating parts feeder with a gravity feed track, feeding small boxes of "Beechies." The spectator pushes a button in the front of the cabinet and the track discharges a package of the "Beechies" into a receptacle.

Other operating equipment will include a lapping-polishing machine and a feeder display, including a vibrator spiral elevator and weighing feeder.



Syntron Vibrating Parts Feeder with gravity feed track dispensing "Beechies"

FAST • EASY • SENSITIVE
Just Spray On
Spotcheck®
DYE PENETRANT INSPECTION



Non-visible
crack as detected
on carbide tool

CONVENIENT — EASY TO USE!
Spotcheck - in pressurized spray cans.

DOES THE JOB EASIER!
Detects cracks in tools, parts, machinery.
NO OTHER EQUIPMENT NEEDED!
No pumps, hoses, brushes, compressors.

PORTABLE — USE ANYWHERE!
Sensitive inspection in the field or plant.



**Complete SK-1 Kit
only \$35.00**

Plus \$1.00 packing
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Prices apply in con-
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Also available in
bulk cans at lowest
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Please send us _____ SK-1 Kit(s) at \$35.00
each, plus \$1.00 each, shipping and handling.

Send only Free Illustrated Bulletin now.

Send information on bulk quantities, prices.

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Over 85% of the torque wrenches used in industry are

Sturtevant TORQUE WRENCHES

Read by Sight, Sound or Feel

- Permanently Accurate
- Practically Indestructible
- Faster—Easier to use
- Automatic Release
- All Capacities

in inch grams
...inch ounces
...inch pounds
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Every manufacturer,
design and production
man should have this valuable
data. Sent upon request.

PA Sturtevant Co.
ADDISON, ILLINOIS

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Small PRECISION PINS

MADE TO
BLUE PRINT

Dowel — Straight
Countersunk — Taper
 $\pm .0001''$ Accuracy
.030" to .125" Diam.
Up to 2" Length

Precision Centerless Grinding Since 1931
Inquiry Invited on Your Volume Requirements

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8605 CEDAR AVE. Phone EN 1-3412 CLEVELAND 3, O.

For more data circle 713 on Reader Service Card

396 modern machine shop

ASTE Exposition . . .

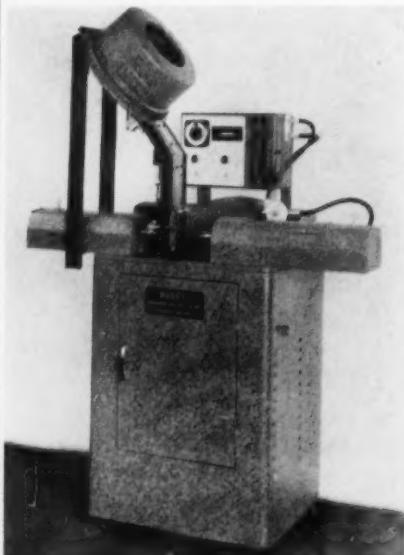
Other equipment to be displayed includes power tools, hopper level switches, flow control valves, paper joggers, heating elements, shaft seals and selenium rectifiers.

For more data circle 102 on Reader Service Card

★ ★ ★

AUTOMATIC NUT COUNTER-SINKING MACHINE

In Booth No. 739, Model Machine Co., Inc., 4729 Hawthorne St., Philadelphia 24, Pa., will exhibit for the first time the Model "N" Automatic Nut Countersinking Machine, a fully automatic machine developed to accurately countersink both sides of the through hole in nut blanks to a controlled depth and square with the face. The Model "N" will accommodate nut blanks of



Model "N" Automatic Nut Countersinker

March, 1956

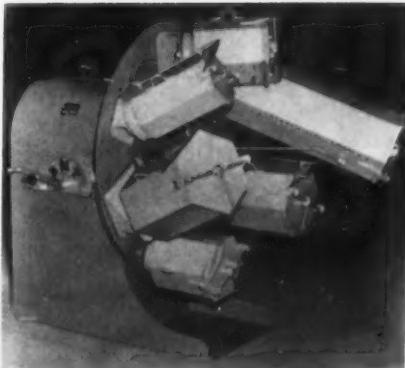
sizes 2-56 up to and including 1/2-13, through the use of individual tracks, available from stock. Other sizes are available on special order. According to the manufacturer, the set-up time is less than one-half hour due to the simplification of design. The production rate is approximately 3,000 blanks per hour on the 1/2-13 and over 5,000 blanks per hour on the 2-56 size.

For more data circle 103 on Reader Service Card

* * *

BARREL FINISHING EQUIPMENT, ABRASIVES, MEDIA AND COMPOUNDS

Metal surface finishes, as fine as the proverbial "cat's whisker," will be demonstrated in Booth No. 709 by BMT Mfg. Corp., Elmira, N. Y. The display will show metal and plastic parts of all shapes and size currently being finished by barrel tumbling. On exhibit for



BMT Multi-Barrel Slide Honing Machine

the first time will be the latest model BMT Multi-Barrel Slide Honing Machine, a modern precision tumbling unit with controlled-motion honing that does not affect dimensional tolerances of parts, yet removes burrs, flash, tool marks, rust, paint, plating and heat

* * * *
COLLINS

MICROFLAT®

**BLACK
GRANITE**

- SURFACE PLATES
- ANGLE PLATES
- STRAIGHT EDGES

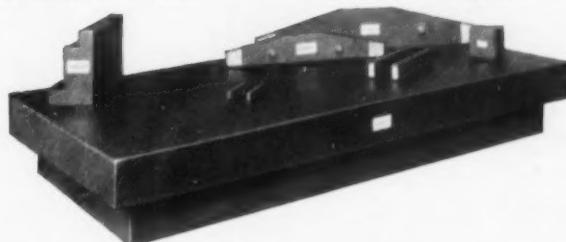
- LAYOUT PLATES
- PARALLELS
- T-SLOTTED PLATES

COLLINS MICROFLAT

surface plates and precision accessories offer the user life-time accuracy at a minimum cost

All sizes —

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COLLINS MICROFLAT COMPANY, INC.

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For more data circle 714 on Reader Service Card

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BARKER BENCH MILL
in OPERATION**



\$295.00
As Shown

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Chicago
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731



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Details

500 GREEN RD., CLEVELAND 21, OHIO

**BARKER
ENGINEERING
COMPANY**

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GANT

RIVETERS



• Pioneers in the riveting field. Head rivets from smallest to $\frac{3}{4}$ " diameter, either by noiseless spinning or vibrating hammer method.—Sizes to meet all needs.—Types include Vertical and Horizontal Multiple Spindles. Write for literature — and don't forget to send samples.

THE GRANT MFG. & MACHINE CO.
96 Silliman Ave. . Bridgeport 5, Conn

For more data circle 716 on Reader Service Card

398 modern machine shop

ASTE Exposition . . .

treating scale, and contributes to finer micro-finish and color of metal.

Also on exhibit will be a complete representation of barrel finishing compounds for use in all stages of finishing operations, ranging from heavy deburring to micro-finish burnishing and cleaning, rinsing and anti-rusting. Barrel finishing media for use with compounds will complete the exhibit.

For more data circle 104 on Reader Service Card

★ ★ ★

**FULLY-AUTOMATIC
CUT-OFF MACHINE**

A new, fully-automatic cut-off machine with bar stock feed will be exhibited by Stone Machinery Co., 316 Fayette St., Manlius, N. Y., in Booth No. 755. This machine combines a fast



Stone Fully-Automatic Cut-Off Machine

March, 1956

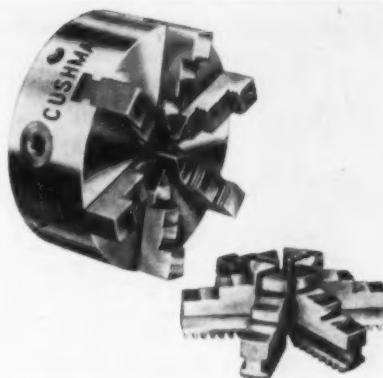
electro-pneumatic bar feed with power stroked cutting head for fully automatic production cutting. Speeds of up to 1,600 cuts per hour can be attained and work is said to be turned out with a milled finish, eliminating need for further machining.

For more data circle 105 on Reader Service Card

★ ★ ★

SCROLL-TYPE CHUCKS

The Cushman Chuck Co., Hartford, Conn., will introduce the Accra-Set Chuck, the Compensating Scroll Chuck and the Air-Operated Compensating Chuck in Booth No. 579. The Accra-Set Chuck has been especially designed for minute accuracy, which must be held to closer limits than possible with the standard scroll-type chucks. Adjustment is simple and quick, and the chuck will repeat to 0.0005 inch or bet-



Cushman Accra-Set Scroll-Type Chuck

ter, total indicator reading. The adjusting mechanism of the Accra-Set consists of four adjusting screws, equally spaced about the the periphery of the chuck body and placed on a com-

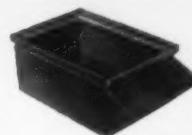
STERLING "TOP RIM" CONSTRUCTION MAKES THE BIG DIFFERENCE

● Our "TOP RIM" construction provides stronger support all around the box—no corner inserts to come loose and fall out. We invite comparison in design, construction and price.

Efficiency in designing and manufacturing allows us to quote favorably on any type or size stacking box.

WRITE FOR LITERATURE
AND PRICES.

Sterling Factory Equipment Co., 183 Charles St., Providence, R. I.



Sterling Bin Front "Top Rim" Steel Stocking Box. Size 8" x 12" x 6".



Sterling "Top Rim" Steel Stocking Box with drop handles. Size 16" x 12" x 6".



Sterling

Quality Handling & Storage Equipment

For more data circle 717 on Reader Service Card



Specifications
 Table Movement:
 6" x 10"
 Table Size:
 7" x 17½"

LINLEY BROTHERS CO.

661 State St. Ext.,
 BRIDGEPORT 1, CONN.

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Handle your small
 part precision
JIG BORING
 on the
LINLEY
JIG BORER

Why tie up your big,
 costly jig borers on small
 work when you can get
 maximum utility at less
 cost per hour on a ma-
 chine exactly fitted to
 your work. Put your small
 work on the LINLEY
 where it belongs and
 reserve your large ma-
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 where large work be-
 longs. You'll save money
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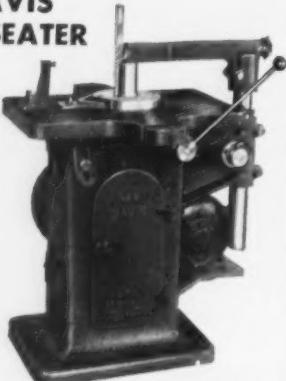
Complete details sent
 promptly on request

Why Use A Shaper to cut Keyways when a **DAVIS KEYSEATER**

will
 do the
 job so
 much
 quicker
 and
 better?

*

Send
 for
 Circular



DAVIS KEYSEATER CO.
 Exchange and Glasgow Sts.
 ROCHESTER, N. Y.

For more data circle 719 on Reader Service Card

400 modern machine shop

ASTE Exposition . . .

pound angle. The screws always make full end face contact with hardened steel balls, which have one flat plane to provide this face contact and which are free to find their own pivotal position in the rigidly mounted back plate of the chuck. Adjustment of the screws against the balls easily shifts the chuck body carrying the jaws, scroll and pinion to dead center and, at the same time, draws the body solidly against the back plate, as well as positively locking it against rotational slippage. Accra-Set chucks, ideal for precision bar work, are available with three or six jaws in 6, 8 and 10 inch sizes. These chucks are furnished with a straight recess back and require adapter plates for spindle mounting.

For more data circle 106 on Reader Service Card

★ ★ ★

SILVER ALLOY BRAZING

In Booth No. 275, Handy and Harman, 82 Fulton St., New York 38, N. Y., will feature a high production silver alloy brazing job, which will be transplanted from a customer's shop to provide an active demonstration. A collection of samples from other applications will be displayed, showing how manufacturers are taking advantage of the speed, low cost and versatility in joining metals with Easy-Flo and Sil-Fos silver brazing alloys, as well as Handy Flux.

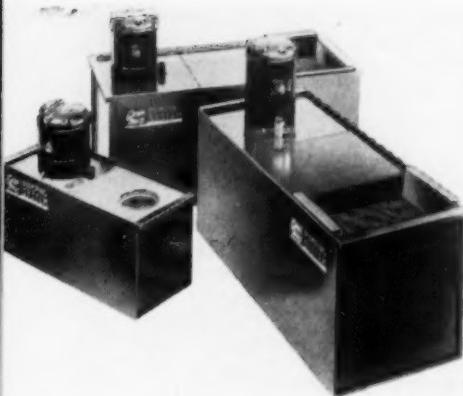
For more data circle 107 on Reader Service Card

★ ★ ★

COOLANT PUMPS AND PUMPING UNITS

The Graymills Corp., 3705 N. Lincoln Ave., Chicago 13, Ill., will display its complete line of new "Superflo"

March, 1956



Graymills "Superflo" Pumping Units

coolant pumps and pumping units in Booth No. 360. There are 36 standard models, all available to J.I.C. standards. These units are completely interchangeable with similar pumps of other

makes and the new catalog, which will be available at the booth at the show, will have interchangeability tables. For more data circle 108 on Reader Service Card

★ ★ ★

PRESSES, PUMPS AND CONTROLS

A new 1-ton Multipress will be shown to the metalworking industry for the first time in Booth 1706 by The Denison Engineering Co., 1160 Dublin Rd., Columbus 16, Ohio. The new press has been designed for cost reduction on assembling, riveting, punching, marking, timing, pelleting, compacting, testing, straightening, broaching, swaging and similar operations. In addition to introducing the new Multipress, Denison will also display their Multipump, as well as other lines of precision built pumps, motors and control equipment.

The exceptional versatility of the new 1-ton Multipress is said to enable

Put machines on ISOMODE® PADS

- ✓ to absorb vibration
- ✓ reduce noise
- ✓ cut maintenance

Economical, effective mounting — 1 sq. ft. enough for 4 tons of machine weight. Neoprene — lasts for years. 5/16" thick, 18" square, tan to the standard package. Easily cut to shape and installed under most machines — big punch presses included. No cementing necessary. Write for Bulletin No. 415.

MB Manufacturing Company
A division of Textron American, Inc.
1067 State Street, New Haven 11, Conn.

For more data circle 720 on Reader Service Card

March, 1956

CLIPPER

PRECISION DIAMOND TOOLS

Industrial Diamonds

Thread Grinders

Turning Tools

Engraving Tools

Dressing Tools

Diamond Powder

Manufacturers of

DIAMOND WHEELS

and Hones of

highest quality.

Prompt delivery.

Ask for literature

Representatives in Principal Cities

CLIPPER DIAMOND TOOL CO., INC.

21C W. 46 ST. N.Y. 36



For more data circle 721 on Reader Service Card

modern machine shop 401

ASTE Exposition . . .

manufacturers to adopt the machine to many applications. The machine has been designed to fit into automated lines, working in conjunction with various types of feed mechanisms. The ram pressure of the unit can be quickly set from 500 to 2,000 pounds. A dual electric control system is designed to insure

safety, as the unit will operate only when both hands are on the actuating buttons.

For more data circle 109 on Reader Service Card

★ ★ ★

AUTOMATIC DRILLING AND TAPPING UNITS

The Model "KH" Automatic Drilling Unit and the Model "KT" Automatic Tapping Unit will be exhibited in Booth No. 1226 by The Govo-Nelson Co.,

1933 Antoinette St., Detroit 8,

Mich. Having an overall length of

approximately 23½ inches, the

Model "KH" drilling unit utili-

zes a ¼-h.p., 60-

cycle, three-phase,

two-speed, 3,450/

1,200 r.p.m., en-

closed motor. The

drilling speed is

3,400 r.p.m. only.

The stroke of the

drilling unit is ad-

justable up to 1½

inches maximum.

Full hydraulic

control is exter-

nally adjustable

for rapid ap-

proach, rate of

feed and length of

stroke. With sim-

ple exterior ad-

justment, the unit

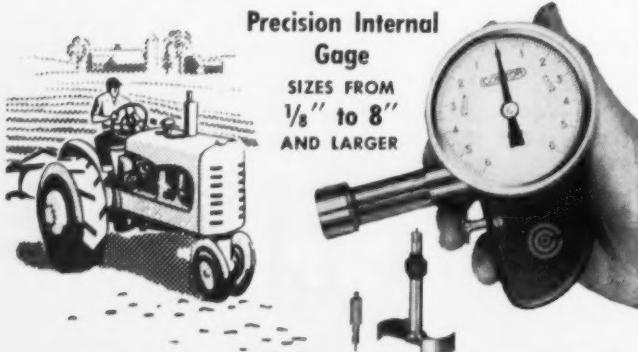
will accommodate

1/32 to ¼-inch

tools with a stand-

Did you know that ---

**Leading farm machinery makers
rely on this precision gage.**



Precision Internal Gage

SIZES FROM
1/8" to 8"
AND LARGER

COMTORPLUG with interchangeable expanding plugs to gage simple or special bores from 1/8" to 8" dia.

Unique Advantages

- Positive gaging accuracy to fraction of .0001" regardless of who operates it.
- Indicates actual size, a fixed—not passing—reading.
- Positive 2-point gaging—automatic centering.
- Shallow holes, deep holes, inside splines, open-end holes gaged easily.
- Detects ovality, back or front taper, bell mouth, barrel shape.
- Reaches to bottom of blind holes.
- Gages work while still held in chuck.
- A shop tool for all-day every day use.
- Portable—no wires, hoses or stands.

Investigate the gage used by the thousands in jet engine, automotive transmission, household appliance, farm machinery, guided missile and other volume-precision plants. IT MAKES PRECISION GAGING EASY . . . at machine . . . at inspection bench . . . for selective assembly. No other like it—investigate and see why.

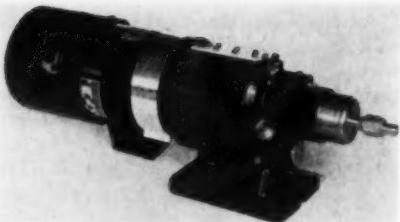
COMTOR COMPANY

64 Farwell St.
WALTHAM 54,
MASS.

GET THE FACTS—
REQUEST BULLETIN 48



For more data circle 722 on Reader Service Card



Govro-Nelson Model "KH" Drilling Unit

ard collet chuck, depending on the material and drilling conditions. A special chuck for tools up to $\frac{3}{8}$ inch in soft materials can be supplied.

The Model "KT" tapping unit has no clutch, no lead screw and no gears. Its overall length is also approximately 23 $\frac{1}{2}$ inches. The tapper utilizes a $\frac{1}{4}$ -h.p., 60-cycle, three-phase, 1,800-r.p.m., reversing, enclosed motor. The tapping speed is 1,725 r.p.m. only.

For more data circle 110 on Reader Service Card

AIR GRINDERS, FILTERS AND REGULATORS

M-B Products, Detroit, Mich., will exhibit its complete line of pneumatic grinders, automatic air-line filter, regulators, lubricators and air-traps in Booth No. 557.

For more data circle 111 on Reader Service Card

★ ★ ★

FILE-CUTTING MACHINE

Demonstration of a file-cutting machine will feature the display by Heller Tool Co., Newcomerstown, Ohio, in Booth No. 256.

For more data circle 112 on Reader Service Card

★ ★ ★

CARBIDE TOOLING

The Wesson group of companies (Ferndale, Brighton and Lansing, Michigan; Lexington, Kentucky) is

★ ★ ★

HEATS FAST SAVES TIME

johnson

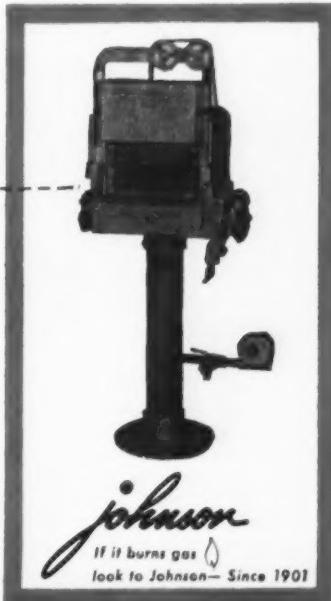
NUMBER 142 HEAT TREATING FURNACE

Powerful burners in this efficient furnace get heat up to the 1300°-2350° F. range in minutes. Temperatures accurately and quickly regulated. Does fast job with high speed and carbon steels. Ratchet-operated door opens upward. High temperature, refractory-lined firebox is 7" by 13" by 16 $\frac{1}{2}$ ". 200,000 BTUs per hour. Carbofrax hearth, G.E. Motor and Johnson Blower included, F.O.B. Factory\$337.00

Write today for free Johnson Catalog

JOHNSON GAS APPLIANCE COMPANY
571 E Avenue NW, Cedar Rapids, Iowa

For more data circle 723 on Reader Service Card



ASTE Exposition . . .

planning to introduce to the metalworking industries in Booth No. 450 two completely new developments of major importance — one in the rotary tools field and one in the machine field. The two developments, while fundamentally unrelated to each other, are expected to contribute toward sizeable reductions in overall tool cost on both single-point and multiple-point tools.

Other recent new Wesson developments in carbide tooling will also be displayed for the first time.

For more data circle 113 on Reader Service Card



MILLING MACHINES

Barker Engineering Co., 500 Green Rd., Cleveland 21, Ohio, will display and operate its Standard 1/3-H.P. Bench Mill, the new Model A.M. $\frac{3}{4}$ -H.P. Heavy-Duty Mill and the new

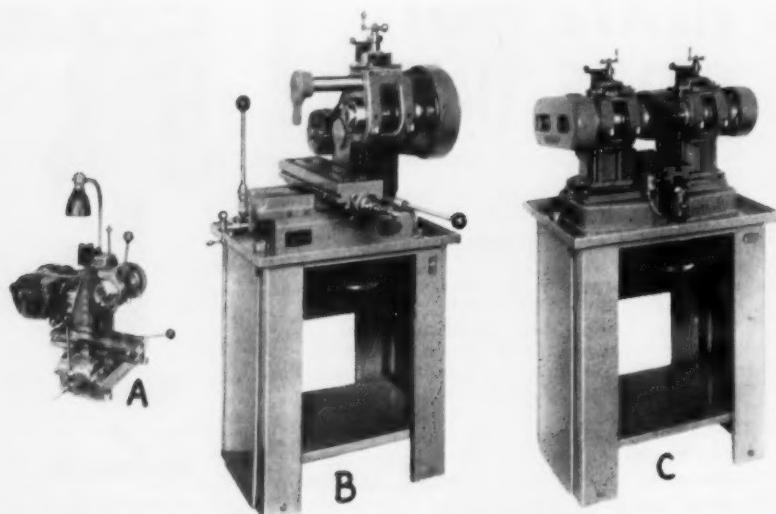
Dual-Mill. The standard 1/3-h.p. bench mill is a versatile machine, featuring three-way travel for the production milling of small parts by unskilled operators. The new Model A.M. weighs approximately 500 pounds and is furnished complete with a pedestal. The new Dual-Mill is equipped with two ball-bearing, heavy-duty, totally-enclosed, 1/3-h.p. motors. A Barker variable speed drive is said to make it possible to run either spindle at different speeds to accommodate the proper cutter for the milling operation desired.

For more data circle 114 on Reader Service Card

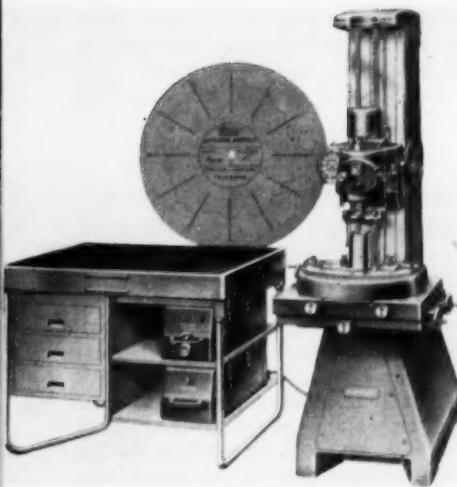


MEASURING INSTRUMENTS, CIRCULAR TABLES AND TOOLING

In Booth No. 1020, Engis Equipment Co., 431 S. Dearborn St., Chicago 5, Ill., will feature the new Talyrond Measuring Instrument. The performance of this electronic machine for measuring the roundness of parts, such

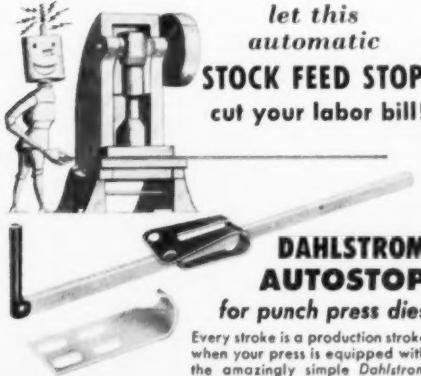


(A) Barker Standard Bench Mill. (B) Barker Model A.M. Heavy-Duty Mill. (C) Barker Dual-Mill



Talyrond Roundness Measuring Instrument

as balls, rollers, pistons, cylinders, bearing races, and so on, will be shown



\$175 each

- ★ SPEEDS PRODUCTION
- ★ CUTS WASTE
- ★ INCREASES PROFITS

BRANCH MFG. CO. 15 Olson Drive, North Branch, Minn.

For more data circle 724 on Reader Service Card

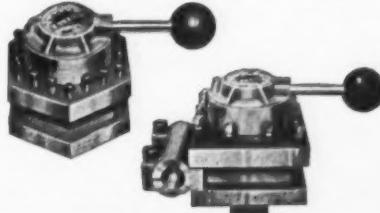
March, 1956

by samples and test graphs. Radial magnification is variable from 50 to 10,000, depending on depth below top of work. With the part to be tested held stationary, the instrument's ultra-precision spindle holding stylus and pick-up, it is claimed, produces a permanent record.

Also displayed will be the Talysurf, an electronic instrument which determines the roughness of surfaces; the 18-Inch Projection Model Microptic Circular Table; TV and optical tooling, showing the latest closed circuit television setup using the alignment telescope; the Taylor-Hobson Sweep Optical Square for determining the lack of true flatness of a plane surface without reference to leveling; the Micro-Alignment Telescope, with zero focus, and a complete range of optical tooling accessories; through-sighting cylindrical optical square to establish whether points lie in a true perpendicular

★ ★ ★

"WEDGE-LOCK" TURRET



Does not raise up when indexing in all 12 positions. 4-way and 6-way block models. Repetitive accuracy to within .0003 plus or minus within itself.

WRITE FOR FOLDER

Makers of Combination Rotary Tables and Angle Plates. Also Helical Gear Speed Reducers, Single and Double Reduction. Also Special Gears of All Types.

Open territory available to representatives.

OLSON INDUSTRIAL PRODUCTS, INC.

40 W. WATER ST. • WAKEFIELD, MASS.

For more data circle 725 on Reader Service Card

modern machine shop 405

ASTE Exposition . . .

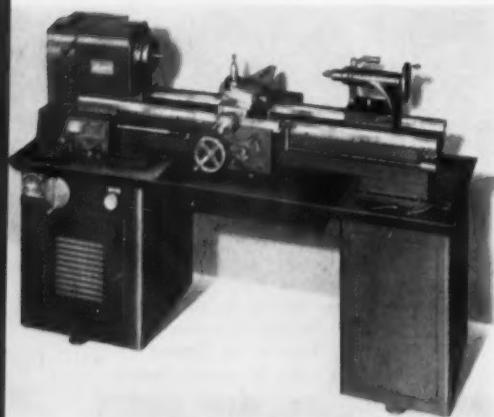
plane; surface finish microscope; the Watts Direct Screen Reading Theodolite with auto-collimating features; precision levels, sight levels, jig transits and theodolites; the improved Hilger & Watts Auto-Collimator reading direct to 1/10 of a second of arc; clinometers for checking angles and inclinations; cylindrical squares; scales and projection units for machine tools; Hyprez Diamond Compounds; and the well-known Di-Profiler Reciprocating Hand Machine.

For more data circle 115 on Reader Service Card

★ ★ ★

LATHES, SHAPERS AND MILLING MACHINES

In Booth No. 900, Logan Engineering Co., Lawrence and Lamon Ave., Chicago 30, Ill., will demonstrate, under power, its line of lathes, shapers and milling machines. The newest Logan lathes, including the variable speed drive 14 and 12-inch swing models, and



Logan No. 6560 Variable Speed Drive Lathe

the widely acclaimed new Logan Vertical Milling Machine are expected to be particular centers of interest.

For more data circle 116 on Reader Service Card

★ ★ ★

POWER HACK SAW BLADES

The Capewell Mfg. Co., Hartford, Conn., will exhibit its hand and power hack saw blades, band saw blades, ground flat tool steel, hammers and pipe fitters' hand tools in Booth No. 1141. An important feature of the exhibit will be an operating power hack saw machine, demonstrating the cutting performance of "Technite," High Speed and Safetech Power Saw Blades.

The Safetech Hand Hack Saw Blade, a high speed, flexible, shatterproof blade with a hardened tooth edge and soft back, which affords complete safety for the operator, will be introduced at the show. This new hand blade is companion to Capewell's shatterproof Safetech Power Hack Saw Blade.

For more data circle 117 on Reader Service Card

★ ★ ★

RUST REMOVAL COMPOUND

Oakite Rustrripper, the alkaline compound that removes rust, oxide scale, paint and shop soils without changing dimensions of precision parts or causing hydrogen embrittlement, will be featured in Booth No. 1325 by Oakite Products, Inc., 19 Rector St., New York, N. Y. According to the manufacturer, Oakite Rustrripper may be used in hot or cold water solutions, with or without current and with or without cyanide. It does not attack sound metal—all action stops as soon as the rust has been removed. It is said to provide temporary protection against rerusting.

Oakite will also feature Oakite Soluble Oil for machining, grinding and cutting; Special Drawing Compound

and Oakite Composition No. 12 for drawing and forming; and alkaline, solvent and acidic detergents for production and maintenance cleaning.

For more data circle 118 on Reader Service Card

★ ★ ★

VERTICAL MILLING MACHINE

Designated as the Model 2UVR, a new, versatile vertical milling machine designed for use in toolrooms, experimental departments, pattern shops or for production use will be featured in Booth No. 605 by Tree Tool and Die Works, 1600 Junction Ave., Racine, Wisconsin.

Features of the new Model 2UVR include a fully universal head, a variable speed spindle drive, a variable quill feed and automatic collet closer, a roller spindle drive, a spindle brake and enclosed micrometer depth stop, a one-clamp turret lock, built-in power table feed, rapid traverse and a one-shot oiling system. Developed with the



Tree Model 2UVR Vertical Milling Machine

March, 1956

LESS DOWN TIME

means...

INCREASED
PRODUCTION
GREATER
EFFICIENCY

LOWER COSTS

SAVAGE TYPE "S" CUTTING TOOLS AND DIES, made of high-carbon, high-cobalt, special high-speed steel, are designed . . .

- FOR LONG LIFE
- TO SHRINK YOUR COSTS
- TO INCREASE YOUR PRODUCTION

PATENTED SAVAGE TOOL-HOLDER permits repeated sharpening with easy tool-length adjustment.

"SAVAGE NIBBLING MACHINES NIBBLE YOUR COSTS"

Quotation on Request

W. J. SAVAGE CO.

NIBBLING MACHINE PIONEERS
Knoxville Since 1885 Tennessee



For more data circle 725 on Reader Service Card

NUMBERALL

CUTS THE COST OF STAMPING NUMBERS

MODEL 70

MULTI-WHEEL NUMBERING MACHINE

The most efficient method of stamping numbers into metal. Repeats the same numbers until changed. Model 70 NUMBERALL Machines are used in all industries to mark various parts. Stamps numbers, etc., quickly . . . neatly. Perfectly aligned. Much better marks are produced by these machines than by single stamps or steel type, and at a far lower cost. Shank for Hand or Press and with any number of wheels from 3 to 20. Can be furnished in 1/32" to 1/8" high figures, sharp face gothic or shaded roman style.



Hand shank illustrated. Press shank for foot or power presses also available.

Write for Bulletin MS-70.

NUMBERALL STAMP & TOOL CO.
HUGUENOT PARK STATEN ISLAND 13, N. Y.

For more data circle 727 on Reader Service Card

ASTE Exposition . . .

operator in mind, the machine is designed for ease of operation and maximum work capacity. Also exhibited will be the Model 2UV Vertical Milling Machine.

For more data circle 119 on Reader Service Card

★ ★ ★

PORTABLE, AIR-POWERED ABRASIVE TOOLS

Designated as X-4, a complete new line of portable, air-powered abrasive tools, which includes completely redesigned Buckeye horizontal grinders and buffers, vertical grinders and sanders and right angle sanders, will be shown for the first time in Booth No. 113 by Buckeye Tools Corp., Division 17, Dayton 1, Ohio. Outstanding feature of the redesigning work on these



Buckeye X-4 C Series Horizontal Grinder

X-4 tools is an entirely new, highly sensitive governor, which enables the tools to develop greater power and to maintain higher speeds under load. It is claimed to be this combination which makes it possible for the X-4 abrasive tools to remove more metal in less time on any abrasive job. Despite the increased power and speed, X-4 models weigh no more and are no larger than previous models.

For more data circle 121 on Reader Service Card

★ ★ ★

DISPOSABLE INDUSTRIAL PAPER WIPER

A new type of disposable industrial paper wiper will be featured in Booth No. 228 by Scott Paper Co., Dept. MM-F, Chester, Pa. These new industrial paper wipers are specially designed to give efficient performance in the complete range of industrial wiping from heavy machinery to precision work and are now, for the first time, being made available in two different sizes. The original size wiper, Scott Brand No. 59, consists of two-ply sheets that measure $9\frac{5}{8} \times 13\frac{5}{8}$ inches. For industrial wiping jobs that can be accomplished with a smaller size wiper, Scott Brand No. 58 is available, consisting of two-ply sheets that measure $9\frac{5}{8} \times 10\frac{1}{4}$ inches. Both products are identical except for size, and they are being packaged in newly designed boxes, each containing 125 wipers, with 18 boxes to a case. The compact size of each carton takes up a minimum of space in an industrial plant, and it provides employees with an instant and mobile source of wipers when and where needed.

For more data circle 202 on Reader Service Card

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PRODUCTS

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- MACHINE KEYS
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- COTTER PINS
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NEW BRIGHTON PA.

For more data circle 747 on Reader Service Card

MILLING MACHINES

In Booth No. 351, Nichols-Morris Corp., 76-H Mamaroneck Ave., White Plains, N. Y., will feature the Nichols Twin Mill, a precision two-spindle bed-type miller designed for simultaneous milling of opposite or adjacent surfaces, horizontally or vertically. The two geared milling heads are independent units, with separate drives and controls. They may be quickly adjusted, not only vertically and transversely with respect to each other, but may be offset longitudinally as well. This unique three-way adjustability of each milling head is said to add flexibility and allow simultaneous milling of two relatively widely separated surfaces on one setup and with one work-holding fixture. A wide range of spindle speeds allows milling of ferrous or non-ferrous materials with high speed or carbide-tipped cutters. The Twin Mill is completely push-button controlled, arranged for automatic table cycling—with rapid approach, variable cutting feed and rapid return.

Also displayed will be the new Nichols Model 8-SA Heavy-Duty Semi-Automatic Miller; the Nichols Stand-

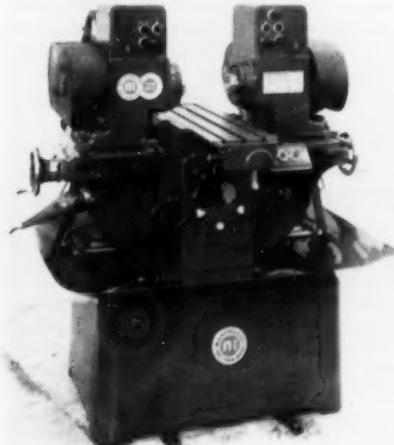


Illustration showing the Nichols Twin Mill

March, 1956



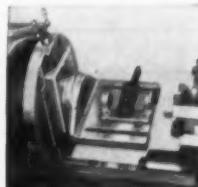
CARTER PRODUCTS CO. INC.

426 Wm. Alden Smith Bldg.
30 Ionia Avenue, S.W.

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Now . . . a low-cost universal work holding fixture for use on lathes and most other machine tools! Attachments shown below hold any round or irregularly shaped part, position it fast and accurately for any operation. Users report big savings! Accurate to .001".

Write for free demonstration or Bulletin No. 112



MICRO-CHUCK

Division, SCOTT-BROWNE CORP.
Batavia Pike • Newtown, Ohio

For more data circle 729 on Reader Service Card

modern machine shop 409

ASTE Exposition . . .

ard Miller; the Nichols Toolroom Miller; the Nichols Model 6-SA Semi-Automatic Miller; milling accessories; and the Ellis Double-Swivel Dividing Head. For more data circle 203 on Reader Service Card



DIAL GAGES

Four new dial gages will be exhibited in Booth No. 717 by Nilsson Gage Co., Inc., Box 505, 255 Mansion St.,

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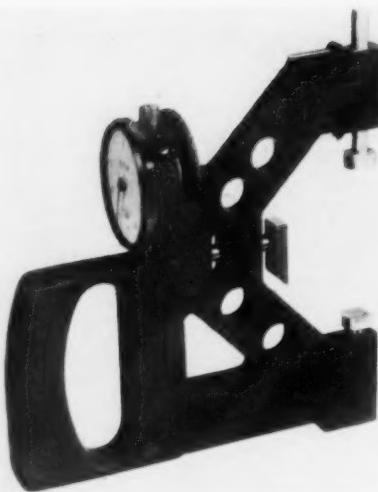
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Eastern Centerless Grinding Co.
470 Tolland Street East Hartford 8, Conn.

For more data circle 732 on Reader Service Card



View of Nilco Rotatable Cam Dial Snap Gage

Poughkeepsie, N. Y. The new Nilco Rotatable Cam Dial Snap Gage with a range of 1 inch has a new easy locking device which can be set without the aid of wrenches. The adjustable anvil remains perfectly parallel over a 1-inch travel and is locked on both outer ends of the bearing surface simultaneously. The Nilco Economy Dial Snap Gage is designed to operate in coolant or soluble oils without losing its accuracy. It has a 1-inch range. Also shown will be a spiral groove gage, dial scribing gage and the Nilcoid Indicator.

For more data circle 204 on Reader Service Card

ATTENTION MANUFACTURERS' REPRESENTATIVES

Machinists' tool manufacturer plans change in sales set-up. Desires manufacturers' representatives to handle complete line exclusively in various sections of the United States and Canada. Will consider men of high calibre with good following. Send complete resume of territory and lines now handling to Box No. 31, c/o Modern Machine Shop, 431 Main St., Cin'ti, 2, Ohio.

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new literature

Use the Reader Service Cards opposite pages 32 and 436 for requesting free copies of the literature listed below.

122. Bending Blocks

Acorn Iron & Supply Co., Delaware Ave. and Poplar St., Philadelphia 23, Pa. Bending blocks or welding platens.

123. Round Hole Dies

Adamas Carbide Corp., Dept. J-77, Kenilworth, N. J. Round hole dies.

124. Tool and High Speed Steel

Allegheny Ludlum Steel Corp., 2020 Oliver Bldg., Pittsburgh 22, Pa. "The Working of Tool and High Speed Steels."

125. Cylinders and Valves

The A. K. Allen Co., 57 Meserole Ave., Brooklyn 22, N. Y. Allenair cylinders, valves, clamps and indexing tables.

126. Light-Duty Press

Alva Allen Industries, Dept. MM, Clinton, Mo. Model LTX ½-Ton Light-Duty Power Bench Type Press.

127. Welding Electrodes

Ampco Metal, Inc., 1745 S. 38th St., Milwaukee 46, Wis. "Welding with Ampco Bronze Electrodes—Filler Rod—Wire."

128. Millers, Shapers, Saws

Austin Industrial Corp., 76 Mamaroneck Ave., White Plains, N. Y. Sajo milling machines and hack saws and VMA and Prema shapers.

129. Joining Tubing Steels

Tubular Products Division, Babcock & Wilcox Co., Beaver Falls, Pa. Joining, by arc welding, various tubing steels.

130. Progress-Thru Machines

W. F. & John Barnes Co., 301 S. Water St., Rockford, Ill. Automatic progress-through machines.

131. Disc Grinders

Besly-Welles Corp., 108 Dearborn Ave., Beloit, Wis. Various types of disc grinders adaptable to unusual grinding jobs.

132. Throatless Shear

Beverly Shear Mfg. Co., 3000 W. 111th St., Chicago 43, Ill. Electric throatless shear which produces 1,725 strokes per minute.

133. Drill Grinder

Edward Blake Co., Inc., 437 Cherry St., West Newton 65, Mass. Worcester Drill Grinder.

134. Multiple-Point Presses

E. W. Bliss Co., Canton, Ohio. Multiple-point enclosed presses.

135. Ovens and Furnaces

Blue M Electric Co., 138th and Chatham St., Blue Island, Ill. Electric ovens, furnaces, water and oil baths, humidity cabinets and incubators.

136. Toolholder

Brookfield, Inc., Stoughton, Mass. Toolholder with adjustable V-jaw for holding a wide range of diameters without bushings.

137. Granite Surface Plates

Bryant Chucking Grinder Co., Springfield, Vt. Rock of Ages granite surface plates.

138. Flame Hardening Units

The Cincinnati Milling Machine Co., Cincinnati 9, Ohio. "Flamatic" Flame Hardening Machines.

139. Mallets and Hammers

Chicago Rawhide Mfg. Co., 1233 Elston Ave., Chicago 22, Ill. Rawhide mallets, hammers and mauls.

140. Inverted-Y Conductors

The Cleveland Crane & Engineering Co., 6462 E. 281 St., Wickliffe, Ohio. Aluminum inverted-Y conductors, supports and collectors.

141. Contour Band Saw

The DoAll Co., Des Plaines, Ill. The Contour-matic Band Machine.

142. Indexing Turntables

Eisler Engineering Co., Inc., 734 S. 13th St., Newark 3, N. J. About 150 various types of indexing turntables, rotating turntables, and angle tables.

143. Spacing Unit

Erickson Tool Co., 2304-11 Hamilton Ave., Cleveland 14, Ohio. The Master Spacer for milling, drilling, inspection, and other operations.

144. Rotary Files and Tools

Essex Rotary File & Tool Corp., 295 Madison Ave., New York 17, N. Y. Hand-made rotary files and tools.

145. Hydraulic Power Units

Ex-Cell-O Corp., Detroit 32, Mich. Quill-type hydraulic power units for step drilling and other operations.

146. Presses, Saws and Shears

Famco Machine Co., 3122 Sheridan Rd., Kenosha 26, Wis. Power presses, arbor presses, air presses, drill presses, foot presses, band saws and shears.

147. End Mill Grinder

William H. Field Co., Inc., 325 Dorchester Ave., Boston 27, Mass. "Centra-Point" End Mill Grinder for sharpening small tools.

148. Clutches

Formsprag Co., 23601 Hoover Rd., Van Dyke, Mich. Standard clutches and clutch-coupling units.

149. Oven Sections

The Fostoria Pressed Steel Corp., Fostoria, Ohio. Radiant rod oven sections.

150. Silicone Rubber Products

Garlock Packing Co., Palmyra, N. Y. Line of silicone rubber products.

151. Self-Tapping Inserts

Groov-Pin Corp., 1135 Hendricks Causeway, Ridgefield, N. J. "Tap-Lok" Self-Tapping Inserts for strong threaded connections.

152. Pumping Unit

Graymills Corp., 3705 N. Lincoln Ave., pumping unit.

153. Optical Tap Checker

Hanson-Whitney Co., 173 Bartholomew Ave., Hartford 2, Conn. Optical tap checker for visual checking of tap hook angle.

154. Lathes, Millers, Chuckers

Hardinge Brothers, Inc., Elmira, N. Y. Toolroom and production lathes, millers, chucking machines, collets, feed fingers and other accessories.

155. Grinding Fixture

Harig Mfg. Corp., 5765 W. Howard St., Chicago 31, Ill. "Grind-All" Fixture for precision grinding of perforators.

156. Visible Grinding

Carl Hirschman Co., Inc., 30 Park Ave., Manhasset, N. Y. Visible grinder featuring the Stephan Visible Grinding Method.

157. Chucks

Horton Chuck, Windsor Locks, Conn. Independent, universal, combination, light-duty and two-jaw chucks, as well as face plate and boring mill jaw chucks.

158. Hydraulic Fluid

E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa. Houghto-Safe fire-resistant hydraulic fluid.

159. Turret Drilling Machine

Howe & Fant, Inc., 29 Fitch St., East Norwalk, Conn. Turret drilling machine which performs up to six different operations.

new literature.. (Use reader service cards opposite pages 32 and 436 for free literature.)

160. Live Centers

Ideal Industries, Inc., 1031 Park Ave., Sycamore, Ill. Line of live centers to meet practically all turning needs.

161. Hold-Down Vise

Illinois Metal Products, 429 W. Superior St., Chicago 10, Ill. IMP "Hold-Down" Vise.

162. Vertical Milling Machine

Index Machine Co., 540 N. Mechanic St., Jackson, Mich. Improved Super 55 Vertical Milling Machine.

163. Shuttle-Drive Conveyors

Industrial Filtration Co., Dept. SD-294, 13 Industrial Ave., Lebanon, Ind., Delpark Shuttle-Drive Conveyors.

164. Shims

Laminated Shim Co., Inc., 3302 Union St., Glenbrook, Conn. "Laminum" Shims for use in precision products.

165. Air and Vacuum Pumps

Leiman Bros., Inc., 149 Christie St., Newark 5, N. J. Line of rotary air and vacuum pumps.

166. Welder and Power Unit

The Lincoln Electric Co., Cleveland 17, Ohio. The "Weldanpower," a combination 200-amp. welder and a 4-kva standby a.c. power unit.

167. Vacuum Sheet Lifters

F. J. Littell Machine Co., 4163 Ravenswood Ave., Chicago 13, Ill. Vacuum sheet lifters and safety equipment for the pressroom.

168. Borer and Miller

Marac Machinery Corp., 45 S. Broadway, Yonkers, N. Y. Schwartzkopff KBF2 Precision Self-Locking Boring and Milling Machine.

169. Arbors and Chucks

Master Spline Tool and Gage Co., 19760 W. Eight Mile Rd., Detroit 19, Mich. Locking spline arbors and chucks.

170. Marking Dies

Jas. H. Matthews & Co., 3944 Forbes St., Pittsburgh 13, Pa. Press-style marking dies.

171. Core Drills

Metal Cutting Tools, Inc., 350 S. Water St., Rockford, Ill. New Metcut Pin-Mount Core Drills with improved two-piece design.

172. Speed Reducers

Cone-Drive Gears Division, Michigan Tool Co., 7171 E. McNichols Rd., Detroit 12, Mich. Shaft-mounted speed reducers.

173. Twin Milling Machine

Nichols-Morris Corp., 76-H Mamaroneck Ave., White Plains, N. Y. Twin Mill which features twin milling heads.

174. Reciprocating Tool

Nord Corp., 18 Spruce St., Nutley, N. J. The "Reciprofiler" for complete die filing operations.

175. Bending Machine

Paul Machine Tool & Die Works, 4600 S. Kedzie Ave., Chicago 32, Ill. "Bend-Ex" Automatic Tube Bender.

176. Tracer-Controlled Miller

Pratt & Whitney Co., Inc., 25 Charter Oak Blvd., West Hartford 1, Conn. Keller BL 3622 Model C. Automatic Tracer-Controlled Milling Machine.

177. Surfacing Machine

Production Machine Co., Greenfield, Mass. Twin-belt surfacing machine for grinding, sanding, surface polishing and deburring.

178. Keyseat Cutters

Quality Tool Works, 792 S. Market St., Waukegan, Ill. Stagger-tooth Woodruff keyseat cutters.

179. Calibration Kit

Rahn Granite Surface Plate Co., 636 N. Western Ave., Dayton 7, Ohio. Calibration kit for checking surface plates.

180. Valves and Cylinders

Rivett Lathe & Grinder, Inc., Brighton 35, Boston, Mass. Line of valves, cylinders and power units.

181. Machine Vise Set

Rockford Engineered Products Co., 2324 23rd Ave., Rockford, Ill. Repco two-piece machine vise set for increasing clamping capacity.

182. Adapters and Extensions

Scully-Jones and Co., 1909 S. Rockwell St., Chicago 8, Ill. Adjustable adapters and spindle extension assemblies.

183. 15-Inch Swing Lathe

Stanley Sheppard, 30 Church St., New York 7, N. Y. Harrison 7½-Inch Center, 15-Inch Swing Lathe. Specifications are included.

184. Portable Power Tools

Skil Corp., 5033 Elston Ave., Chicago 30, Ill. More than 100 models of industrial portable power tools, including various accessories.

185. Toolroom Lathes

South Bend Lathe Works, South Bend 22, Ind. 13-inch precision lathes and a wide variety of accessories.

186. Ultrasonic Inspection

Sperry Products, Inc., Danbury, Conn. The Ultrasonic Reflectoscope for non-destructive testing.

187. Die Spring Chart

Standard Die Set Manufacturer, Inc., Providence, R. I. Selection chart for chrome-vanadium die springs.

188. Miniature Fasteners

Standard Pressed Steel Co., Jenkintown 22, Pa. Miniaturization in fastening devices.

189. Hydraulic Systems

Sun Oil Co., 1608 Walnut St., Philadelphia 3, Pa. Trouble-shooting chart for hydraulic systems.

190. Milling Machine

Sundstrand Machine Tool Co., 2539 Eleventh St., Rockford, Ill. The C1 Rigidmil which is designed for milling small parts.

191. Production Chuck

Thomas Hoist Co., 28 S. Hoyne, Chicago 12, Ill. Production chuck for use on turrets, engine lathes, cut-off machines, drill presses or any type chucking machine.

192. Cylindrical Gages

Threadwell Tap & Die Co., Greenfield, Mass. Gaging policy, tolerances, care control and use of cylindrical gages.

193. Chucking Reamers

Twentieth Century Mfg. Co., Box 429 M, Libertyville, Ill. "Supeream" Chucking Reamers in decimal sizes.

194. Synthetic Fluids

Carbide and Carbon Chemicals Co., 30 E. 42nd St., New York 17, N. Y. Ucon synthetic fluids and lubricants.

195. Carbides

Vascoloy-Ramet Corp., 858 S. Market St., Waukegan, Ill. All the facts on V-R carbide products.

196. Boring Bar Insert

E. F. Vilter Co., 4161 N. Richards St., Milwaukee 12, Wis. "Tru-Hole" Micrometer Adjustable Boring Bar Insert.

197. Boring Machine

Wadell Equipment Co., 119 South Ave., Garwood, N. J. VBM Automatic Vertical Precision Boring Machine.

198. Wire Drawing Machines

Waterbury Farrel Foundry & Machine Co., Waterbury, Conn. Continuous tandem wire drawing machines.

199. Hydraulic Machinery

Watson-Stillman Press Division, Farrel-Birmingham Co., Inc., Roselle, N. J. Plastic molding machines, extrusion presses and special machinery.

200. Toolholders

Wesson Co., 1220 Woodward Heights Blvd., Ferndale 20, Mich. Multicut Toolholders for no-grind indexable carbide inserts.

201. Lever Punches

W. A. Whitney Mfg. Co., 636 Race St., Rockford, Ill. Various types of hand lever punches.

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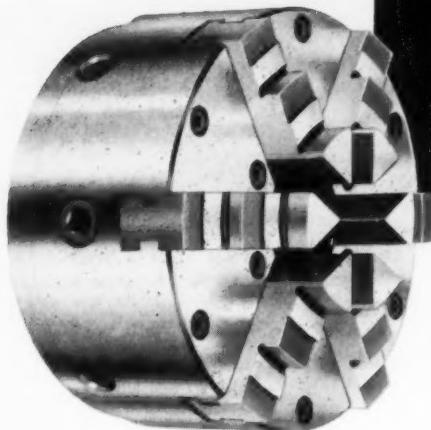
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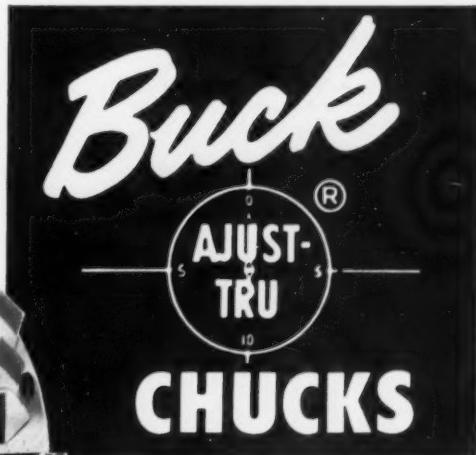
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give YOU all the
advantages of*



How To Make Sure It's A Buck Chuck

Most Buck chucks carry a nameplate reading "Ajust-Tru." An even more distinguishing feature are the 12 cap screws that hold the chuck and the chuck adapter together. These 12 large screws are also an indication of the durable, rugged construction of the Buck. Keep them in mind when you buy.

Buck chucks come in 6, 3, and 2 jaws—adaptable to lathes, grinders, dividing heads, and screw machines. Sizes from 4" to 9".



The Buck is the *original precision scroll chuck*, and the 6-jaw design was truly revolutionary.

It has been so successful others have copied its appearance and attempted to copy its performance. As might be expected the substitutes don't measure up to the original Buck.

It means that 6 jaws are no longer the distinguishing hallmark of the Buck. You have to look *twice*, when you buy, to make sure you are getting a Buck to get the maximum savings in costly machinists' time plus the construction that guarantees long accurate service. Your Buck distributor will gladly point out the Buck advantages. Catalog gladly sent on request.

BUCK TOOL COMPANY

314 SCHIPPERS LANE • KALAMAZOO, MICH.

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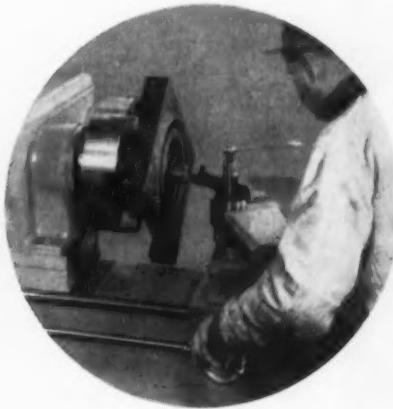
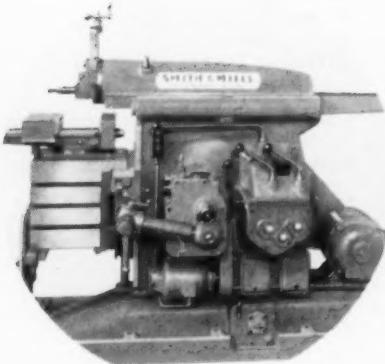
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March, 1956

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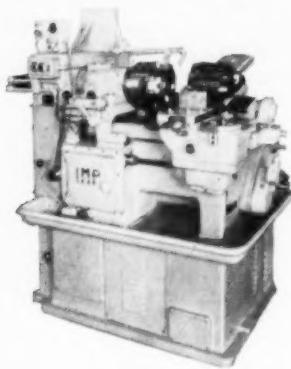
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Model "N"

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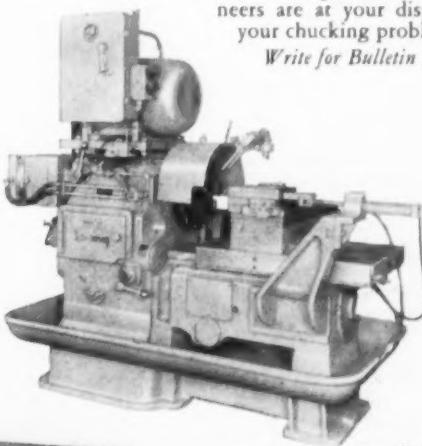
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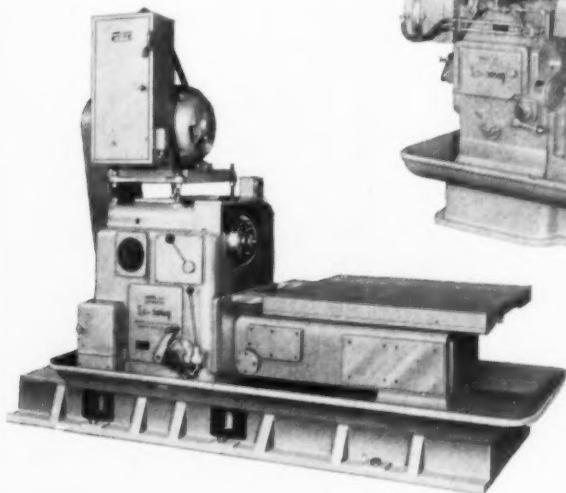
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 H. P. Capacity . . . 20



Model "AN"

→
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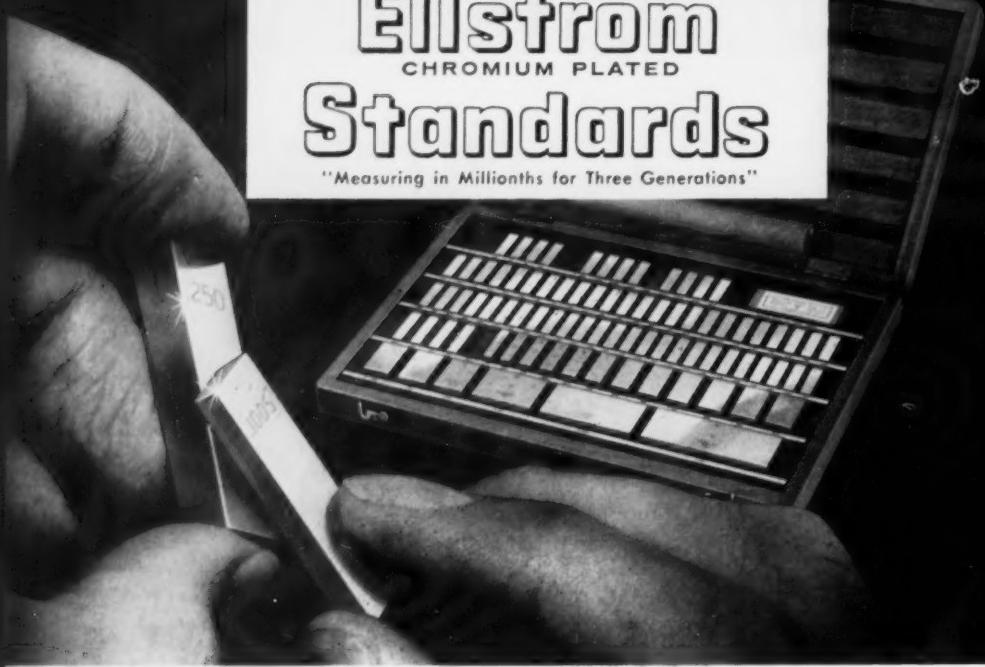
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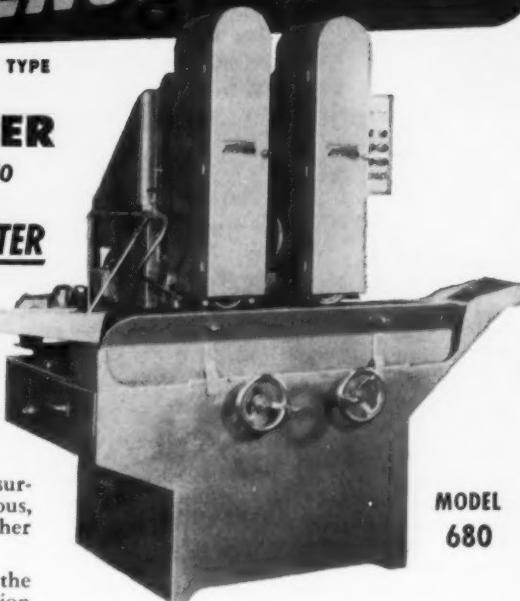
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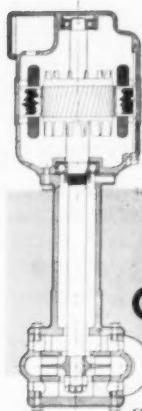
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1817 READING ROAD

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CINCINNATI 2, OHIO

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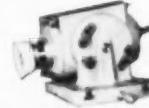


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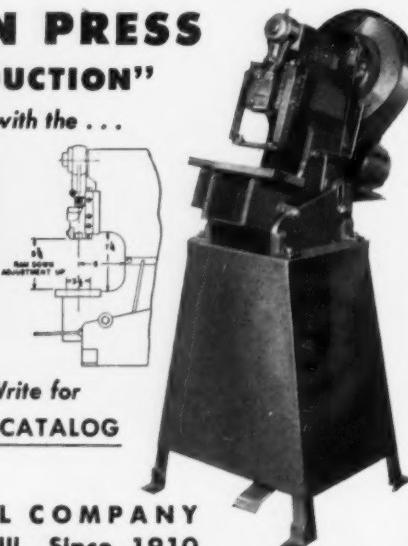
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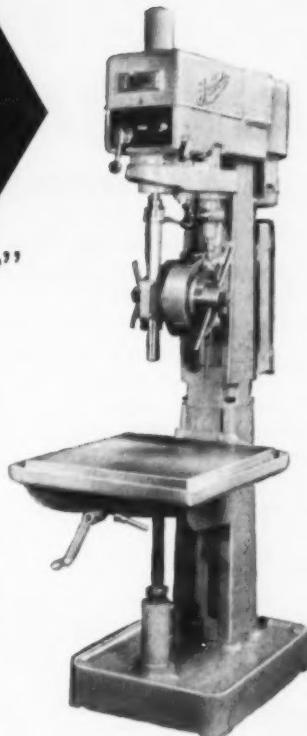
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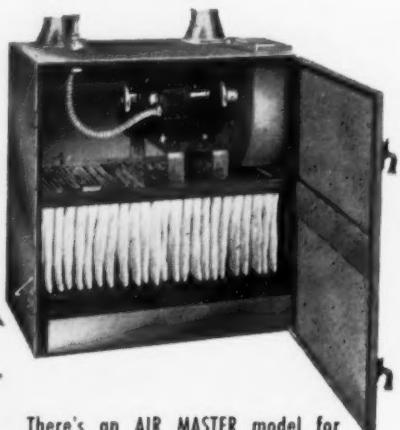
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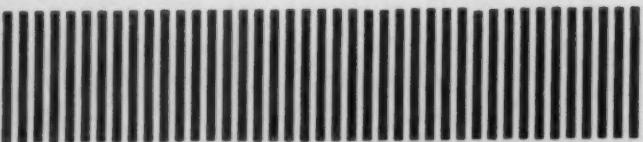
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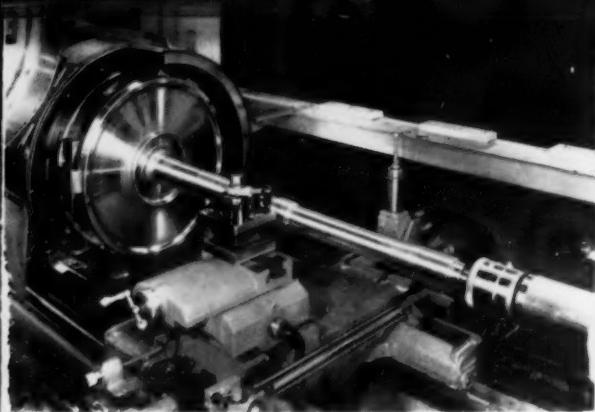
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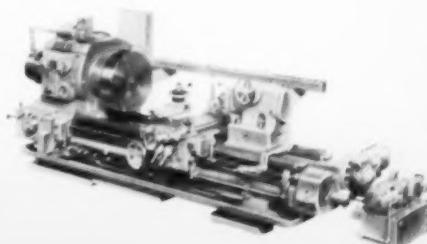
The most important application of the DUAL TRACER is in the machining of complex contours on the periphery, bore or face of a component.

Reduced to its basic elements, the DUAL TRACER Lathe consists of two (or dual) hydraulic motors controlled by one tracing stylus. One motor controls the carriage cross feed, the other longitudinal feed.

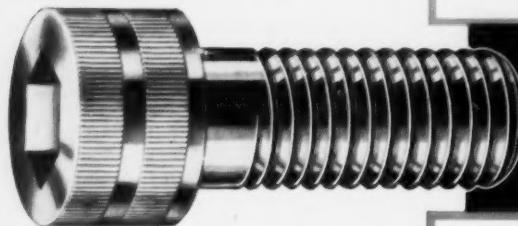
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